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REPORT on X-RAY FLOURESCENCE FIELD STUDY OF SELECTED PROPERTIES IN VICINITY OF FORMER USS LEAD REFINERY FACILITY, EAST CHICAGO, INDIANA

October 2003

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Reference #81

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FINAL

**REPORT on X-RAY FLOURESCENCE FIELD STUDY
OF SELECTED PROPERTIES IN VICINITY OF FORMER
USS LEAD REFINERY FACILITY, EAST CHICAGO, INDIANA**

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ACRONYMS AND ABBREVIATIONS USED

AATS	American Analytical & Technical Services, Inc.
ECAB	Enforcement and Compliance Assurance Branch
EMPA	electron microprobe analysis
FPM	Field Project Manager
GPS	global positioning system
IDEM	Indiana Department of Environmental Management
IM	Interim Measures
LEGS	Laboratory for Environmental and Geological Studies
LOD	level of detection
MRFI	Modified RCRA Facility Investigation
MS	matrix spike
MSD	matrix spike duplicate
NIST	National Institute of Standards and Technology
NRMRL	National Risk Management Research Laboratory
PM	Project Manager
PPE	personal protective equipment
ppm	parts per million
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
RCRA	Resource Conservation and Recovery Act
SAP	Sampling and Analysis Plan
SOP	standard operating procedure
SRM	Standard Reference Material
USEPA	U.S. Environmental Protection Agency
XRD	x-ray diffraction
XRF	x-ray fluorescence

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1. INTRODUCTION

This report was prepared by the U.S. Environmental Protection Agency (USEPA) to document results from the USS Lead Refinery, Inc., and Vicinity Quality Assurance Project Plan (QAPP) and associated Sampling and Analysis Plan (SAP) prepared by USEPA, dated July 2003 (USEPA 2003). The report summarizes the X-ray fluorescence (XRF) field data which were identified in the SAP as needed to further characterize the soils in the vicinity of the USS Lead Refinery, Inc. (USS Lead), in East Chicago, Indiana. The report also identifies further work to be conducted by the laboratories selected following the methods described in the SAP.

1.1 PROJECT HISTORY AND SUMMARY

1.1.1 Site History

USS Lead is a former lead smelter located at 5300 Kennedy Avenue, East Chicago, Indiana. See Figure 1. The facility was constructed in the early 1900s by the Delamar Copper Refinery Company to produce copper. In 1920, the property was purchased by U.S. Smelting, Refining, and Mining, and later by USS Lead. At that time, lead refining operations were conducted at the facility. Between 1972 and 1973, the facility was converted to a secondary lead smelter, which recovered lead from automotive batteries. In or before November 1980, USS Lead conducted hazardous waste management activities, including management of waste piles of lead dust and lead-containing calcium sulfate. Secondary lead smelting operations ceased by 1985. The constituents of concern at the site include lead, copper, arsenic, zinc, antimony, barium, cadmium, silver and tin, among others.

On November 18, 1993, USEPA and USS Lead entered into an Administrative Order on Consent (AOC) pursuant to Section 3008(h) of the Resource Conservation and Recovery Act (RCRA). The AOC requires USS Lead to implement interim measures (IM), including site stabilization and construction of a corrective action management unit (CAMU), and conduct a modified RCRA Facility Investigation (MRFI). As part of the MRFI, USS Lead conducted an off-site characterization to determine the nature and extent of contamination from its facility. The results of the investigation (see Figure 2) have indicated that airborne metal releases, mainly lead, have migrated into soils from off-site areas adjacent to the facility via the airborne pathway. However, other soil data available for a broader area in the vicinity of the facility (see Figure 3) show that lead concentrations at certain areas, including locations near residential properties, exceed 400 milligrams per kilogram (mg/kg) of lead in soil. The USEPA's Office of Solid Waste and Emergency Response recommends using 400 mg/kg soil lead as a screening level for lead in soil from residential scenarios. Screening levels are defined as a level of contamination above which there may be enough concern to warrant further investigation.

1.1.2 Sampling Area

The SAP was implemented during the period from July 23, 2003 through August 12, 2003. The area sampled under this study is shown in Figure 1 and sample locations are further described in Table 1. The area sampled covered the Calumet and East Calumet neighborhoods of the City of East Chicago, Indiana, as well as selected industrial properties further south in East Chicago and Hammond, IN. In all, 83 soil samples were collected and analyzed, plus environmental duplicates and QA/QC samples.

1.2. PURPOSE OF STUDY

The purpose of the study was to collect information to fill data gaps identified in the SAP with respect to concentrations of metals in soil from residential and industrial properties, as well as public properties (vacant lots, parks, former industrial properties). The field data collected will be used in conjunction with laboratory data to determine if USS Lead needs to conduct additional off-site sampling to further characterize the nature and extent of off-site contamination caused by its past industrial operations. The data can also be used, in conjunction with existing data, to determine the need for remediation of soils.

To achieve the purpose, the FSAP called for USEPA staff to measure concentrations of lead related to airborne deposition present in surface soil in the vicinity of the USS Lead site using the field portable Niton XRF unit (concentrations for other metals of concern including zinc were also recorded by the instrument). Upon screening with the XRF, concentrations of lead were compared to appropriate screening levels (400 ppm) to identify contamination that may pose concern. Those locations with levels of lead above the screening level were selected for sample collection to be later considered for laboratory analysis.

Information was also obtained for every screening and sampling location for development of a Geographic Information Systems (GIS) database for this project.

Laboratory analysis for lead and other metals of concern will be conducted for the samples selected, for confirmation of the XRF data. Separate analyses will also be conducted aimed at determining whether there is presence of contamination related to the USS Lead facility that warrants further investigation or whether the contaminants are related to other facilities or other anthropogenic sources. The results and interpretation of the laboratory data will be reported separately from this report.

1.3 REPORT ORGANIZATION

This report presents the field data. Section 2 discusses the methods employed, Section 3 summarizes the results, and Section 4 identifies references used. Detailed documentation is

included in the Appendices.

2. METHODS

2.1 ACCESS

Access to public and private properties in East Chicago, Indiana was acquired by USEPA personnel prior to and concurrent with implementation of the work. Access agreements in the form of consent forms were maintained on site during conduct of the work. Access was required from the following parties: private home owners and businesses, Resco Products, Inc. (former Harbison-Walker property), the City of East Chicago, the Chicago Public Housing Authority, and the EJ&E Railroad.

Since sampling was not intrusive (sampling interval limited to top 1 inch), utilities were not contacted prior to sampling.

Access agreements for all samples collected are contained in Appendix A.

2.2 SAMPLING OVERVIEW

This Section describes the soil sampling conducted during the periods of July 23-24, 2003, July 29-31, 2003, August 5-7, 2003, and August 10, 12, and 21, 2003.

Historical sampling locations from prior sampling efforts by USS Lead are shown in the SAP and on Figures 2a & 2b. Past sampling efforts by both USEPA and the Indiana Department of Environmental Management (IDEM) are shown in Figure 3. This information was used in planning this sampling event and was referred to as necessary throughout the conduct of the work.

2.3 SAMPLING PROCEDURES

2.3.1 Soil Sampling Procedures

Soil sampling was completed at 83 locations, as shown in Figures 4 through 8. All samples were collected by either Michael Mikulka or Mirtha Capiro of USEPA, or Mike Sickels of IDEM using the procedures identified in the SAP. Sample locations had not been identified in the QAPP or SAP since sample collection was dependent upon individual property owners granting access. Access was sought prior to or concurrent with each day's sampling activities, and property owners granting access usually had their properties sampled the same day or the following day, with some exceptions.

The period just prior to initiation of sampling was unseasonably wet, requiring that sampling be postponed for several days initially in order to allow the ground surface to dry. Weather conditions were perhaps wetter and cloudier than expected for the season throughout the sampling event. Morning temperatures each day were usually around 70-75 degrees Fahrenheit, typically warming as the day progressed. Each day was sufficiently sunny to allow air drying of samples collected prior to XRF analysis. No sampling was conducted on any day when it rained, due to uncertainties associated with sample drying in the field during rainy conditions.

Soil for screening and sample collection was composited from a residential house yard or public area (vacant lot, park, ball diamond) using a 5 point composite (see Figure 10) in accordance with procedures described in EPA Guidance Document *Superfund Lead-Contaminated Residential Sites Handbook*, OSWER 9285.7-50 (Draft) October, 2002; or, for industrial property, from a one (1) square meter area (m^2) area. Typically, soil was scraped from upper 1-2 inches of the target areas using a pre-cleaned disposable plastic scoop or spoon, then placed in a pre-cleaned disposable plastic bowl or other container for homogenization. If the target area was covered with grass, the grass was cut away with a knife with a stainless steel blade and pulled back to expose the soil for sample collection. At industrial properties, a stainless steel shovel was used as necessary to clear tall grass from the areas where the composite sample was collected. Approximately 4 scoops of soil were obtained from each point in the 5-point composite, for a total of 20 scoops of soil. Upon collection of the soil sample, the grass was replaced and tamped down. The bowl of sample material was transported back to the processing area, where grass, roots and rocks were removed manually (or in some cases with a Number 8 mesh stainless steel sieve), and the bowl labeled and covered with foil. If the soil was wet, the foil was pulled back and the bowl placed in the sun to allow the soil to air dry, while mixing periodically to allow drier surface soil to mix with wetter soil. Once the soil was sufficiently dry (depending on conditions, up to 4 hours drying time on some samples), 4-5 scoops of the sample were placed in a re-sealable 1 quart plastic bag for XRF analysis. All XRF screening was conducted on a bagged sample. After screening, it was determined whether to proceed with sample collection based on the screening result. Sample collection also included field duplicate collections from locations S03 & S07 (samples D03 & D07), and matrix spike/matrix spike duplicate (MS/MSD) sample collection from location S07 (sample M07).

Photos of each of the samples were not taken, in order to speed up the sampling process, and because photographs of each sample location did not appear to materially add to the information being collected. A log of the photographs as well as the photographs taken, are shown in Appendix B. Upon completion of sample processing, if soil screening levels for lead exceeded 400 ppm, then sample bottles were prepared from the sample bowl. Section 3.2 of the SAP, Selection of Screening and Sampling locations, explains the rationale for proceeding with sample collection for consideration for laboratory analysis. Upon filling and labeling, the sample bottles were placed in an iced cooler within the vehicle used for equipment storage and remained within the custody of the processing personnel. Splits of samples collected were offered to personnel

from Resco, but they declined.

On August 7, 2003, those samples for which processing was not able to be completed before the end of the day were covered with foil, labeled, and placed in coolers filled with ice for secure storage at the USEPA CRL. On August 10, 2003, air-drying and processing of the samples was continued, and the samples were analyzed by Mirtha Capiro of USEPA with the Niton XRF instrument.

Re-sampling was conducted at certain XRF screening locations that were not originally selected for sample collection for laboratory analysis, but were later determined (after review of all XRF data), to be appropriate locations for sample collection. Locations X07 and X08 were re-sampled on August 12, and location X20 was resampled on August 21, by Mirtha Capiro of USEPA. Re-sampling included 5 point composite sampling and homogenization as per the SAP, but did not include XRF screening. As such, the laboratory results from these samples will not be directly comparable to the XRF results, as they are not from the same sample. These samples should be considered co-located samples.

2.3.2 Horizontal Location Control

USEPA personnel identified the location of each soil sample collected for XRF analysis with a flag labeled with the XRF location number, as per the SAP. Locations were concurrently or later recorded by USEPA personnel using a Trimble global positioning system (GPS) unit. GPS coordinates were recorded within the instrument and later downloaded into a spreadsheet. Table 1 identifies the specific locations of each soil sample collected for XRF analysis.

2.3.3 Sample Logging

The specific property address where each composite sample collected for XRF analysis was taken was also noted in the field log book. Each location was identified with a unique identifier (XRF #) and its general location described in the field log book. Sample locations relative to the house and other structures are shown in the field log book and sometimes also on the consent form/access agreement. Copies of the consent forms are contained in Appendix A. Information on the properties sampled is contained in Table 2 and Appendix E. A copy of the field notes are contained within the USEPA project files .

2.3.4 Deviations from the SAP

During the first day of project field activities, it was decided by the PM in conjunction with the FPM that individual samples would not be photographed, and the locations where the samples were collected would also not be photographed. An address of each location is provided in the field logbook and on the consent form should further access or information about any specific

property be necessary. A log of all photographs taken as well as the photographs, are contained in Appendix B. The photographs show the typical sample and screening using the XRF unit. This was considered sufficient for project purposes.

No other deviations from the approved SAP were noted.

2.4 LABORATORY ANALYSES

Samples were collected to be considered for laboratory analyses from 29 locations out of the 83 locations screened using the XRF (about 35%). Of those locations, considering the results of the XRF data, 20 locations (about 24%) were selected for laboratory analyses of fine and residual fractions for semi-quantitative scans for target metals and lead isotopes, and quantitative scans for selected metals, by American Analytical & Technical Services (AATS). In addition, the same 20 locations were selected for electron microprobe analysis by the Laboratory for Environmental & Geologic Studies (LEGS). See Table 4a for a listing of these locations. A duplicate sample (D03) was selected from location S03 to be analyzed by AATS, and from location S07 (D07) by LEGS. A sample (M07) was collected for MS/MSD analyses by AATS. If matrix spike samples are required by the method used by LEGS, the laboratory has been directed to use available sample volumes to generate its own MS/MSD sample. In addition, a rinsate blank sample (R01) was collected to be analyzed for target metals by EPA Method 6020 by AATS. Samples which will not be analyzed at this time are being stored at USEPA's Central Regional Laboratory in its secure sample storage area. A list of those samples is contained in Table 4b.

A chain-of-custody record for each set of samples was maintained throughout all sampling activities and accompanied samples to the laboratory. See Appendix C.

2.4.1 Laboratory Protocols

The specific analytes requested for each sample are identified in Table 5. Table 5 in the FSAP identifies the analytical methodology and target detection limits for each parameter.

2.4.2 Deviations from the SAP

The SAP identified that samples would also be collected and analyzed by X-Ray diffraction (XRD) by EPA's National Risk Management Research Laboratory (NRMRL). After the first two days of sampling, discussions with the NRMRL revealed that such analyses would not yield useful results if the lead values were less than 10,000 ppm. In light of the results (all samples <2,000 ppm), further efforts to collect samples for XRD analyses by NRMRL were abandoned. This deviation was documented in a telephone conversation record in the field log book.

3.0 RESULTS

3.1 XRF RESULTS

XRF readings were taken for 83 locations. Lead results for each location are shown in Table 3.

Based on the theory of operation of the XRF instrument, data which are recorded for which the actual value recorded is less than 3σ are considered invalid. Those with a value between 3σ and 10σ are considered quantitatively uncertain, and those with values greater than 10σ are considered valid readings. Generally, longer readings using the instrument yield a lower σ , and hence more useful data. For the purposes of this study, a 60 second reading time (or greater) with the XRF generally yielded usable results for lead (Pb). Where Pb readings were low (< 100 ppm), a longer time was usually necessary in order to generate a reading greater than 10σ . If after a longer reading time this still did not occur, the Pb values presented in Table 3 and elsewhere in this report are considered quantitatively uncertain, since $3\sigma < \text{result} < 10\sigma$. In no case was the Pb result for any sample $< 3\sigma$, so the data collected using the XRF instrument for Pb in this study are of excellent quality. Pb results from the XRF are shown in Figures 4a and 4b for all sample locations.

The XRF instrument was able to collect data for the following other metals, in addition to Pb: Iron (Fe); Zinc (Zn); Zirconium (Zr); Rubidium (Rb); Molybdenum (Mo); Strontium (Sr); Selenium (Se); Arsenic (As); Mercury (Hg); Copper (Cu); Nickel (Ni); Cobalt (Co); Manganese (Mn); and Chromium (Cr). For most samples, valid data were generated by the XRF for only Pb, Fe, Zn, and Zr. Typically, other metals did not meet the $>10\sigma$ criterion necessary for valid results. The results for Rb were typically quantitatively uncertain. See Appendix E for all results on all metals.

Figures 5a and 5b show the results for Zn. Figures 6a and 6b show the results for Fe. Figures 7a and 7b show the results for Zr. Figures 8a and 8b show the results for both Pb and Zn as it was thought useful to see the results for these two metals together.

Actual XRF reading results for each day of sampling are contained in Appendix E. Tables E-1 through E-3 report all XRF readings recorded during the study. An electronic version of the data is also contained in Appendix F. Appendices E & F also contain a file summarizing information for all properties sampled during the study.

3.2 XRF DATA QUALITY

Quality control checks were run throughout the course of the study to ensure the data being collected by the XRF unit were of sufficient quality. Each day, the instrument was turned on and self-calibration conducted. Upon completion, the unit would indicate it was ready for bulk sample analysis.

At that point, a bag blank was run to verify the instrument was reading properly at the low end. The bag blank was an empty sample bag placed on a wooden cutting board and run for at least 30 seconds. The only metal thought to be in the empty bag at low concentration was zinc, and this proved to be correct. Bag blanks were found acceptable if all readings recorded were at < LOD (level of detection) or $<3\sigma$. If this did not occur, the instrument and cutting board were cleaned using a paper towel sprayed in distilled, de-ionized water generated by EPA's Central Regional Laboratory (CRL). The bag blank was then re-run and considered acceptable if all readings recorded were at < LOD or $<3\sigma$. Results of all bag blank samples are contained in Appendices E & F.

The next quality control check run was an XRF analysis of a Standard Reference Material (SRM) of known concentration, which was then compared to the certified values for the reference material. In this case the SRM used was SRM 2711, a Montana soil. The certified results for the SRM 2711 are contained in the SAP and in Appendix D to this report. The sample of the SRM was contained in a plastic cup specifically designed for use on the Niton soil testing platform. The SRM was acquired for use and prepared for the field effort by John Morris of USEPA's CRL. SRMs were run at the beginning and end of each day to ensure the instrument was working properly. The SRM check was considered acceptable if the XRF result for Pb plus the standard deviation of the result was within the low range of the certified standard. Otherwise, the XRF results should be expected to have a low bias. Results of all SRM quality control checks are shown in Appendices E & F.

If the self-calibration, bag blank, and SRM were all acceptable, then samples were ready to be analyzed by the XRF instrument. This occurred on all days of testing. The only difficulty encountered with the daily quality control checks was with the SRM testing on day one. It was realized after several attempts with unacceptable results that the SRM had to be run using the soil testing platform, but without the shield used for testing normal bulk samples, as the testing platform contains its own shield. This explains the invalid SRM testing results obtained at the beginning of day 1 of testing.

The final field quality control check was a daily precision test run on one individual sample selected due to its Pb level exceeding the 400 ppm screening level. The purpose of the precision sample was to verify proper homogenization of field samples, and that the XRF reading was a true representation of the Pb concentration in the bagged samples. Each precision test was run using at least 7 XRF readings on the selected sample. Validity of the results were evaluated by calculating the relative standard deviation (RSD) of the 7 sample results as per the procedure specified in the QAPP. The results of the precision samples for the 9 days of XRF analysis are shown in Table 6. All results were within the acceptance range for the RSD specified in the QAPP except the results for Pb on July 30, 2003. The RSD for that date was 26.5% vs. the $<20\%$ acceptance criterion. The quality of XRF results for that date are still considered acceptable, however, as the poor result for the precision sample was due to one high reading

(R50, XRF result for Pb of 856 ppm) in the precision set. All other readings for the location X36 for which the precision sample was run were in the range 452-610 ppm. If that one outlier is excluded, the precision criterion for the sample was met.

Bag blanks were run periodically throughout the course of each sampling day, to verify the instrument was still functioning properly. If the result on the bag blank showed elevated levels of any metals, the instrument, shield and cutting board used as a sampling platform were all cleaned using distilled, de-ionized water. Then the bag blank test was rerun using a new clean bag.

The final quality control check will be the laboratory confirmation samples sent to AATS for analysis. All samples were transferred via chain-of-custody to TechLaw for shipment to the laboratory on August 28, 2003. See Appendix C.

3.3 PROJECT DATA BASE

A project database, containing an electronic version of the data and other relevant project information, is contained on a CD as Appendix F.

4.0 REFERENCES

USEPA Technology Innovation Office, web site on X-Ray Flourescence, http://fate.cluin.org/xrf_main.asp

USEPA 2003. Field Sampling and Analysis Plan USS Lead Refinery, Inc. & Vicinity, East Chicago, IN. July 2003.

USEPA 2003. Quality Assurance Project Plan USS Lead Refinery, Inc. & Vicinity, East Chicago, IN. July 2003..

USEPA 2002. *Superfund Lead-Contaminated Residential Sites Handbook*, OSWER 9285.7-50 (Draft) October, 2002.

APPENDIX B

Log of Photographs Taken During Sampling for USS Lead & Vicinity, July 23 - Aug 7

July 23, 2003

1. Home located at 714 E. 151st St, where sample for X07 was taken from front yard.
2. Sample collected from X08 location, showing type of bowl, scoop and knife used for sample collection

July 24, 2003

3. Sample collected from X09 location, showing sample in bowl with scoop used for collection, and aliquot of sample bagged for screening
4. View of home at 810/812 E. 151st Street; side lot of home (visible) was location of X01/S01.

August 6, 2003

5. View of Niton XRF instrument on cutting board
6. View of Niton XRF instrument on cutting board analyzing bag blank
7. View of Niton XRF instrument analyzing cup of standard reference material on soil test platform
8. View of cup of standard reference material on soil test platform
9. View of Niton XRF instrument analyzing bagged soil sample with bowl of sample in background

All photos were taken by Michael Mikulka
Film was Fuji Superia Color, 400 ASA

TABLE 1. USEPA XRF SAMPLE LOCATIONS, EAST CHICAGO, IN

SAMP_ID	UTM X (Meters)	UTM Y (Meters)	UTM Zone	Datum	Longitude (Decimal Degrees)	Latitude (Decimal Degrees)
X01	461484.2050	4607826.221	16	NAD83	-87.46234	41.62123
X02	461456.3840	4607853.956	16	NAD83	-87.46267	41.62148
X03	461494.2060	4607843.756	16	NAD83	-87.46222	41.62139
X04	461378.5790	4607851.342	16	NAD83	-87.46360	41.62145
X05	461348.1060	4607850.178	16	NAD83	-87.46397	41.62144
X06	461333.2380	4607845.108	16	NAD83	-87.46415	41.62139
X07	461371.9200	4607821.405	16	NAD83	-87.46368	41.62118
X08	461290.2210	4607896.935	16	NAD83	-87.46467	41.62186
X09	461505.6060	4608062.808	16	NAD83	-87.46209	41.62336
X10	461509.6080	4607929.490	16	NAD83	-87.46204	41.62216
X11	461561.8890	4607970.763	16	NAD83	-87.46141	41.62253
X12	461565.1730	4608069.445	16	NAD83	-87.46138	41.62342
X13	461471.5940	4607947.019	16	NAD83	-87.46249	41.62232
X14	461228.6940	4607833.897	16	NAD83	-87.46540	41.62128
X15	461237.8140	4607835.914	16	NAD83	-87.46529	41.62130
X16	461268.6980	4607971.295	16	NAD83	-87.46493	41.62252
X17	461147.2300	4607836.692	16	NAD83	-87.46638	41.62131
X18	461148.8440	4607923.056	16	NAD83	-87.46637	41.62208
X19	461185.5070	4607845.632	16	NAD83	-87.46592	41.62139
X20	461224.6330	4607965.778	16	NAD83	-87.46546	41.62247
X21	461333.4660	4608155.052	16	NAD83	-87.46417	41.62418
X22	461173.1790	4608068.483	16	NAD83	-87.46608	41.62340
X23	461356.1960	4608607.669	16	NAD83	-87.46392	41.62826
X24	461441.1690	4608082.698	16	NAD83	-87.46287	41.62354
X25	461377.8520	4608091.176	16	NAD83	-87.46363	41.62361
X26	461384.0740	4608167.239	16	NAD83	-87.46356	41.62429
X27	461281.2410	4608239.414	16	NAD83	-87.46480	41.62494
X28	461271.0370	4608163.605	16	NAD83	-87.46492	41.62426
X29	461397.4730	4608322.860	16	NAD83	-87.46341	41.62570
X30	461441.3130	4608423.791	16	NAD83	-87.46289	41.62661
X31	461502.3660	4608293.505	16	NAD83	-87.46215	41.62544
X32	461500.3820	4608352.318	16	NAD83	-87.46218	41.62597
X33	461583.1770	4608420.767	16	NAD83	-87.46119	41.62659
X34	461341.2430	4608027.525	16	NAD83	-87.46406	41.62303
X35	461407.1350	4608376.410	16	NAD83	-87.46330	41.62618
X36	461219.6540	4608626.129	16	NAD83	-87.46556	41.62842
X37	461163.3110	4608655.976	16	NAD83	-87.46624	41.62869
X38	461338.9960	4608531.225	16	NAD83	-87.46412	41.62757
X39	461338.8300	4608611.063	16	NAD83	-87.46413	41.62829
X40	461884.9990	4608054.137	16	NAD83	-87.45754	41.62330
X41	461819.1960	4608065.229	16	NAD83	-87.45833	41.62340
X42	461879.5710	4608154.339	16	NAD83	-87.45761	41.62420
X43	461811.4100	4608178.371	16	NAD83	-87.45843	41.62442
X44	461924.6220	4608028.038	16	NAD83	-87.45706	41.62307
X45	461504.2000	4608611.856	16	NAD83	-87.46215	41.62831
X46	461579.3830	4608597.904	16	NAD83	-87.46124	41.62818
X47	461979.7780	4608138.336	16	NAD83	-87.45641	41.62406
X48	461225.2880	4608601.492	16	NAD83	-87.46549	41.62820

TABLE 1. USEPA XRF SAMPLE LOCATIONS, EAST CHICAGO, IN

Longitude Latitude

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SAMP_ID	UTM X (Meters)	UTM Y (Meters)	UTM Zone	Datum	(Decimal Degrees)	(Decimal Degrees)
X49	461238.3380	4608419.663	16	NAD83	-87.46533	41.62656
X50	461166.1300	4608337.483	16	NAD83	-87.46619	41.62582
X51	461217.9000	4608474.544	16	NAD83	-87.46557	41.62705
X52	461168.2550	4608427.439	16	NAD83	-87.46617	41.62663
X53	461240.5440	4608249.134	16	NAD83	-87.46529	41.62503
X54	461128.9620	4608520.452	16	NAD83	-87.46664	41.62746
X55	461131.4860	4608343.601	16	NAD83	-87.46660	41.62587
X56	461136.1400	4608205.695	16	NAD83	-87.46654	41.62463
X57	461800.2340	4608539.365	16	NAD83	-87.45859	41.62767
X58	461748.4080	4608490.421	16	NAD83	-87.45921	41.62722
X59	461740.0640	4608664.577	16	NAD83	-87.45932	41.62879
X60	461804.6330	4608661.940	16	NAD83	-87.45854	41.62877
X61	461880.2190	4608110.667	16	NAD83	-87.45760	41.62381
X62	461868.4340	4608389.049	16	NAD83	-87.45776	41.62632
X63	462014.3670	4608115.805	16	NAD83	-87.45599	41.62386
X64	462211.8550	4608198.678	16	NAD83	-87.45362	41.62462
X65	461449.9100	4608622.218	16	NAD83	-87.46280	41.62840
X66	461383.1350	4608600.621	16	NAD83	-87.46360	41.62820
X67	461259.2800	4608591.366	16	NAD83	-87.46508	41.62811
X68	461085.2440	4608589.121	16	NAD83	-87.46717	41.62808
X69	460923.9890	4608598.822	16	NAD83	-87.46911	41.62816
X70	461563.5820	4607023.510	16	NAD83	-87.46133	41.61400
X71	461617.6770	4607048.533	16	NAD83	-87.46068	41.61423
X72	461570.8960	4606948.534	16	NAD83	-87.46124	41.61333
X73	461613.4900	4606965.824	16	NAD83	-87.46073	41.61348
X74	462012.0250	4608500.082	16	NAD83	-87.45604	41.62732
X75	462190.8630	4608524.553	16	NAD83	-87.45390	41.62755
X76	461776.7480	4608037.674	16	NAD83	-87.45884	41.62315
X77	461754.2660	4608019.266	16	NAD83	-87.45911	41.62298
X78	461732.7420	4607998.628	16	NAD83	-87.45936	41.62279
X79	461705.3030	4607963.363	16	NAD83	-87.45969	41.62247
X80	461814.2130	4608087.494	16	NAD83	-87.45839	41.62360
X81	461980.9512	4608235.243	16	NAD83	-87.45640	41.62494
X83	461630.0578	4607905.911	16	NAD83	-87.46059	41.62195
X82	461636.6756	4607900.428	16	NAD83	-87.46051	41.62190

TABLE 2: INFORMATION ON PROPERTIES SAMPLED BY USEPA, EAST CHICAGO, INDIANA

XRF #	Owner	Property Address	Mailing Address	Address 2	Zip Code	Date	Notes 1	Sample	Sample Date
X01	Raymundo Larios	812 E. 151st Street	P.O. Box 883	East Chicago, IN	46312	6/13/03	Vacant Lot; owner of 810 E. 151st St.	S01	
X02	Unknown	806 E. 151st Street		East Chicago, IN	46312	6/13/03	Permission verbally; rear yard	S02	
X03	Robert Lipkovitch	5040 Kennedy Avenue		East Chicago, IN	46312	6/13/03	back yard	S03/D03	7/23/03
X04	Aurora Paz Alvarez	714 E. 151st Street		East Chicago, IN	46312	6/13/03	back yard		
X05	Cleveland Sapp	706 E. 151st Street		East Chicago, IN	46312	7/23/03	back yard		
X06	Cleveland Sapp	704 E. 151st Street		East Chicago, IN	46312	7/23/03	filled and grassed vacant side lot		
X07	Aurora Paz Alvarez	714 E. 151st Street		East Chicago, IN	46312	6/13/03	front yard	S26	8/13/03
X08	Clementine Keaton	5028 Alexander		East Chicago, IN	46312	7/23/03	grassed side yard	S27	8/13/03
X09	William Morgan	4936 Kennedy		East Chicago, IN	46312	7/24/03	back yard		
X10	Sarah Fisher	5016 Kennedy Avenue		East Chicago, IN	46312	6/13/03	back yard		
X11	City of East Chicago	Kennedy Gardens Park	100 W. Chicago Ave	East Chicago, IN	46312	7/30/03	South location	S04	7/24/03
X12	City of East Chicago	Kennedy Gardens Park	100 W. Chicago Ave	East Chicago, IN	46312	7/30/03	North location		
X13	Mary Denard	5011 Melville		East Chicago, IN	46312	6/13/03	back yard		
X14	Dorothy Warner	604 E. 151st Street		East Chicago, IN	46312	7/24/03	grassed front yard, filled		
X15	Viola Brown	608 E. 151st Street		East Chicago, IN	46312	7/24/03	side yard		
X16	Jerry Gillis	5006 Alexander		East Chicago, IN	46312	7/24/03	back yard		
X17	E. Chicago Housing Authority	151st Street & McCook		East Chicago, IN	46312	7/24/04	Former RR Property, South corner/151st	S05	
X18	E. Chicago Housing Authority	151st Street & McCook		East Chicago, IN	46312	7/24/03	Former RR Property, S of 150th		
X19	Willie Mae Leonard	506 E. 151st Street		East Chicago, IN	46312	7/24/03	side yard	S06	7/24/03
X20	Willie Grace Washington	605 E. 150th Street		East Chicago, IN	46312	7/24/03	side and back yard	S29	8/21/03
X21	Devin Crymes	4915 Alexander		East Chicago, IN	46312	7/29/03	side yard		
X22	Raymond Davis	501 E. 149th Place		East Chicago, IN	46312	7/24/03	back yard		
X23	Adrel Carpenter	4725 Alexander Street		East Chicago, IN	46312	7/29/03	back yard		
X24	Cullen Brooks	4929 Melville	4917 Melville	East Chicago, IN	46312	7/29/03	side yard	S07/M07	7/29/03
X25	Willie Brooks	4930 Melville		East Chicago, IN	46312	7/29/03	rear yard		
X26	Janice Peterson	4912 Melville		East Chicago, IN	46312	7/29/03	side and rear yard	S08	7/29/03
X27	Cullen Brooks	4858 Alexander	4917 Melville	East Chicago, IN	46312	7/29/03	side yard		
X28	Euby McGeoger	4912 Alexander		East Chicago, IN	46312	7/29/03	back yard	S09	7/29/03
X29	Clay Brooks	4834 Melville Avenue		East Chicago, IN	46312	7/29/03			
X30	City of East Chicago	MLK Park, 148th/Melville	100 W. Chicago Ave	East Chicago, IN	46312	7/30/03	park with play equipment		
X31	Major Rias	1842 Kennedy Avenue		East Chicago, IN	46312	7/29/03	side and rear yard		
X32	Linda Grant	4826 Kennedy Avenue		East Chicago, IN	46312	7/29/03	back yard	S11	7/30/03
X33	Janette Peterson	4807 Kennedy Avenue		East Chicago, IN	46312	7/30/03	back yard		
X34	City of East Chicago	Lots @ 150th & Alexander	100 W. Chicago Ave	East Chicago, IN	46312	7/30/03	vacant lots		
X35	Dr. Martin Luther King Center	4802 Melville		East Chicago, IN	46312	7/30/03	Grassed area with tables, south		
X36	Sandra Bostic	4719 McCook Avenue		East Chicago, IN	46312	7/30/03	side yard	S12	7/30/03
X37	Roland Stubblefield	4714 McCook		East Chicago, IN	46312	7/30/03	back yard		
X38	City of East Chicago	4745 Alexander (vacant lot)	100 W. Chicago Ave	East Chicago, IN	46312	7/30/03	vacant lot		
X39	City of East Chicago	4723 Alexander (vacant lot)	100 W. Chicago Ave	East Chicago, IN	46312	7/30/03	vacant lot		
X40	George Ventura	4935 Grasselli Avenue		East Chicago, IN	46312	7/31/03	back yard		
X41	City of East Chicago	4931 Grasselli Avenue	100 W. Chicago Ave	East Chicago, IN	46312	7/30/03	Vacant Lot @ Grasselli & 150th	S13	

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TABLE 2: INFORMATION ON PROPERTIES SAMPLED BY USEPA, EAST CHICAGO, INDIANA

XRF #	Owner	Property Address	Mailing Address	Address 2	Zip Code	Date	Access	Notes 1	Sample	Date
X42	Floyd Vorice	4907 Grasselli Avenue		East Chicago, IN	46312	7/31/03	back yard		S14	7/31/03
X43	Nicolas Castro	4904 Grasselli Avenue		East Chicago, IN	46312	7/31/03	side and back yards		S15	7/31/03
X44	Robert Williams	4940 Carey Street		East Chicago, IN	46312	7/31/03	front yard			
X45	Gabriel Fears	4724 Kennedy Avenue		East Chicago, IN	46312	7/31/03	back yard			
X46	Denise Julkes	4729 Kennedy Avenue		East Chicago, IN	46312	7/31/03	back yard			
X47	Roberto Flores	4911 Carey Street		East Chicago, IN	46312	7/31/03	back yard			
X48	James W. Moore	4725 McCook Avenue		East Chicago, IN	46312	7/31/03	side yard			
		4727 McCook Avenue		East Chicago, IN	46312	7/31/03				
X49	Anthony King	4807 McCook		East Chicago, IN	46312	7/31/03	back yard		S16	8/5/03
X50	Bridgette L. Spana	4830 McCook		East Chicago, IN	46312	7/31/03	back yard		S17	8/5/03
X51	Holy Trinity Hungarian Church	4759 McCook		East Chicago, IN	46312	8/5/03	front yard of Rectory			
X52	Joseph Johnson	4806 McCook		East Chicago, IN	46312	8/5/03	back yard			
X53	Cullen Brooks	4853 McCook	4917 Melville	East Chicago, IN	46312	8/1/03	rear yard			
X54	City of East Chicago	West of McCook	100 W. Chicago Ave	East Chicago, IN	46312	7/24/03	former RR property, near school			
X55	City of East Chicago	West of McCook	100 W. Chicago Ave	East Chicago, IN	46312	7/24/03	former RR property, north of		S18	
X56	City of East Chicago	West of McCook	100 W. Chicago Ave	East Chicago, IN	46312	7/24/03	former RR property, 149th Street		S19	
X57	City of East Chicago	Riley Park	100 W. Chicago Ave	East Chicago, IN	46312	7/30/03	ball diamonds , SE			
X58	City of East Chicago	Riley Park	100 W. Chicago Ave	East Chicago, IN	46312	7/30/03	ball diamonds, SW			
X59	City of East Chicago	Riley Park	100 W. Chicago Ave	East Chicago, IN	46312	7/30/03	picnic area, NW			
X60	City of East Chicago	Riley Park	100 W. Chicago Ave	East Chicago, IN	46312	7/30/03	picnic area, NE			
X61	Julio and Lupe S. Medrano	4919 Grasselli	100 W. Chicago Ave	East Chicago, IN	46312	8/1/03	back yard			
X62	Manuel Herrera	4813 Grasselli		East Chicago, IN	46312	8/1/03	side yard			
X63	Clay Brooks	4916 Drummond		East Chicago, IN	46312	7/29/03	back yard			
X64	Clay Brooks	4862 Ivy Street		East Chicago, IN	46312	7/29/03	back yard (daycare)			
X65	Dorothy Berry	4719 Melville Avenue		East Chicago, IN	46312	8/1/03	front and side yards			
X66	Georgi Anne Colquitt	4726 Melville Avenue		East Chicago, IN	46312	7/31/03	side (rear) yard		S20	
X67	Curtis Conway	4730 Alexander		East Chicago, IN	46312	7/31/03	back yard			
X68	Walter D. Davis	459 Vernon Avenue		East Chicago, IN	46312	8/6/03	back yard			
X69	Emma Williams	419 Vernon Avenue		East Chicago, IN	46312	8/5/03	side and back yards			
X70	RESCO Products, Inc.	5501 Kennedy Avenue		Hammond, IN	46323	8/6/03	Dan Franovich			
X71	RESCO Products, Inc.	5501 Kennedy Avenue		Hammond, IN	46323	8/6/03	Dan Franovich			
X72	RESCO Products, Inc.	5501 Kennedy Avenue		Hammond, IN	46323	8/6/03	Dan Franovich			
X73	RESCO Products, Inc.	5501 Kennedy Avenue		Hammond, IN	46323	8/6/03	Dan Franovich		S22	8/7/03
X74	Clifton Rhodes	4752 Drummond		East Chicago, IN	46312	8/6/03	Child Care Center, back yard			
X75	Renea Austin	4739 Euclid		East Chicago, IN	46312	8/6/03	Youth Center, back yard			
X76	EJ&E Railroad	1 N Broadway		Gary, IN	46402	8/7/03	RR property, near 150th		S21	8/7/03
X77	EJ&E Railroad	1 N Broadway		Gary, IN	46402	8/7/03	RR property, 100 SW of X77		S24	
X78	EJ&E Railroad	1 N Broadway		Gary, IN	46402	8/7/03	RR property, south center			
X79	EJ&E Railroad	1 N Broadway		Gary, IN	46402	8/7/03	RR property, N of DuPont		S23	8/7/03
X80	Eloy S. Ramirez	4926 Grasselli Avenue		East Chicago, IN	46312	8/7/03	back yard		S25	
X81	John Galvan	4853 Carey Street, 1st Floor		East Chicago, IN	46312	8/7/03	side and back yards			
X82	Combustion Engineering			East Chicago, IN	46312	8/7/03	South area, NW of RR			
X83	Combustion Engineering			East Chicago, IN	46312	8/7/03	South area, N or RR		S28	8/13/03

**Table 3. XRF QUANTITATIVE RESULTS FOR LEAD (ppm) AND LOCATIONS
USS LEAD VICINITY, EAST CHICAGO, IN**

XRF Location	DATE	RESULT	ERROR	SAMPLE #	Notes
X01	7/23/03	744	38	S01	810/812 E. 151 st St
X02	7/23/03	609	33	S02	806 E. 151 st St.
X03	7/23/03	1390	46	S03, D03	5040 Kennedy
X04	7/23/03	914	38		
X05	7/23/03	527	30		
X06	7/23/03	96**	15		
X07	7/23/03	869*	56	S26	714 E. 151 st St.; 8/12/03
X08	7/23/03	597	50	S27	5028 Alexander; 8/12/03
X09	7/24/03	633	31		
X10	7/24/03	747	33		
X11	7/24/03	1060	39	S04	Kennedy Gardens Pk, S
X12	7/24/03	883*	41		Kennedy Gardens Pk, N
X13	7/24/03	671	28		
X14	7/24/03	275	23		
X15	7/24/03	444	24		
X16	7/24/03	472	29		
X17	7/24/03	699	35	S05	Former RR, N. of 151st
X18	7/24/03	520	32		300' N of X17
X19	7/24/03	1150	40	S06	506 E. 151 st St.
X20	7/24/03	627	31	S29	605 E. 150 th St.; 8/21/03
X21	7/29/03	105**	16		
X22	7/29/03	379	26		
X23	7/29/03	372	26		
X24	7/29/03	827	31	S07, M07, D07	4929 Melville

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**Table 3. XRF QUANTITATIVE RESULTS FOR LEAD (ppm) AND LOCATIONS
USS LEAD VICINITY, EAST CHICAGO, IN**

XRF Location	DATE	RESULT	ERROR	SAMPLE #	Notes
X25	7/29/03	364*	27		
X26	7/29/03	962	44	S08	4912 Melville
X27	7/29/03	188**	19		
X28	7/29/03	608	30	S09	4912 Alexander
X29	7/29/03	435	25		
X30	7/30/03	81**	14		
X31	7/30/03	578	26	S10	4842 Kennedy
X32	7/30/03	626	33	S11	4826 Kennedy
X33	7/30/03	562	27		
X34	7/30/03	184	16		
X35	7/30/03	63**	14		
X36	7/30/03	549*	41	S12	4719 McCook
X37	7/30/03	380	26		
X38	7/30/03	223	21		
X39	7/30/03	321	23		
X40	7/31/03	400	25		
X41	7/31/03	1220	49	S13	Lot opposite 4937
X42	7/31/03	861	33	S14	4907 Grasselli Ave.
X43	7/31/03	626	27	S15	4904 Grasselli Ave.
X44	7/31/03	310	23		
X45	7/31/03	391	24		
X46	7/31/03	459*	33		
X47	7/31/03	252	25		
X48	7/31/03	250	20		

**Table 3. XRF QUANTITATIVE RESULTS FOR LEAD (ppm) AND LOCATIONS
USS LEAD VICINITY, EAST CHICAGO, IN**

XRF Location	DATE	RESULT	ERROR	SAMPLE #	Notes
X49	8/5/03	588	33	S16	4807 McCook
X50	8/5/03	736*	40	S17	4830 McCook
X51	8/5/03	192	19		
X52	8/5/03	402	26		
X53	8/5/03	120**	18		
X54	8/5/03	103**	16		
X55	8/5/03	526+	35	S18	Former RR, S. of 148th
X56	8/5/03	584	35	S19	Former RR, S. of 149th
X57	8/5/03	144**	17		
X58	8/6/03	192	19		Riley Park, SE
X59	8/6/03	239	18		Riley Park, SW
X60	8/6/03	310	22		Riley Park, NW
X61	8/6/03	145	13		
X62	8/6/03	239	20		
X63	8/6/03	161	14		
X64	8/6/03	204	18		
X65	8/6/03	364	23		
X66	8/6/03	590*	33	S20	4726 Melville
X67	8/6/03	373	25		
X68	8/6/03	320	22		
X69	8/6/03	287	21		
X70	8/6/03	210	18		
X71	8/6/03	245	19		
X72	8/7/03	370	21		

**Table 3. XRF QUANTITATIVE RESULTS FOR LEAD (ppm) AND LOCATIONS
USS LEAD VICINITY, EAST CHICAGO, IN**

XRF Location	DATE	RESULT	ERROR	SAMPLE #	Notes
X73	8/7/03	384	28	S22	Resco, Lawn fenceline
X74	8/7/03	378	24		
X75	8/7/03	236	21		
X76	8/7/03	850	36	S21	RR N of DuPont 1
X77	8/7/03	714	29	S24	RR N of DuPont 2
X78	8/10/03	583*	33		RR N of DuPont 3;
X79	8/7/03	1624*	53	S23	RR N of DuPont 4
X80	8/7/03	397	26	S25	4926 Grasselli
X81	8/7/03	325	23		
X82	8/10/03	642	26		CME South
X83	8/10/03	586	31	S28	CME South; 8/7/03

Notes: * = result stated is a mean of 7 replicates; error stated is highest error among 7 replicates

** = result stated is quantitatively uncertain ($3\sigma < \text{result} < 10\sigma$)

+ = result stated is a mean of 2 replicates; error stated is highest error among 2 replicates

A **Bolded** Sample # means the sample has been selected for laboratory analysis

**Table 4a. XRF LOCATIONS SELECTED FOR LABORATORY ANALYSES
USS LEAD VICINITY, EAST CHICAGO, IN**

XRF Location	XRF Date	XRF Result	XRF Error	Sample #	Sample Date	Property Address
X03	7/23/03	1390	46	S03, D03	7/23/03	5040 Kennedy
X07	7/23/03	869*	56	S26	8/12/03	714 E. 151 st St.; 8/12/03
X08	7/23/03	597	50	S27	8/12/03	5028 Alexander; 8/12/03
X11	7/24/03	1060	39	S04	7/24/03	Kennedy Gardens Pk, S
X19	7/24/03	1150	40	S06	7/24/03	506 E. 151 st St.
X20	7/24/03	627	31	S29	8/21/03	605 E. 150 th St.; 8/21/03
X24	7/29/03	827	31	S07, M07	7/29/03	4929 Melville
X26	7/29/03	962	44	S08	7/29/03	4912 Melville
X28	7/29/03	608	30	S09	7/29/03	4912 Alexander
X32	7/30/03	626	33	S11	7/30/03	4826 Kennedy
X36	7/30/03	549*	41	S12	7/30/03	4719 McCook
X42	7/31/03	861	33	S14	7/31/03	4907 Grasselli Ave.
X43	7/31/03	626	27	S15	7/31/03	4904 Grasselli Ave.
X49	8/5/03	588	33	S16	8/5/03	4807 McCook
X50	8/5/03	736*	40	S17	8/5/03	4830 McCook
X66	8/6/03	590*	33	S20	8/6/03	4726 Melville
X73	8/7/03	384+	28	S22	8/6/03	Resco, Lawn fenceline
X76	8/7/03	850	36	S21	8/7/03	RR N of DuPont 1
X79	8/7/03	1624*	53	S23	8/7/03	RR N of DuPont 4
X83	8/10/03	586	31	S28	8/12/03	CME South; 8/7/03

Notes: * = result stated is a mean of 7 replicates; error stated is highest error among 7 replicates

** = result stated is quantitatively uncertain ($3\sigma < \text{result} < 10\sigma$)

+ = result stated is a mean of 2 replicates; error stated is highest error among 2 replicates

Table 4b. XRF LOCATIONS SAMPLED BUT NOT SELECTED FOR LABORATORY ANALYSES, USS LEAD VICINITY, EAST CHICAGO, IN

XRF Location	XRF Date	XRF Result	XRF Error	Sample #	Sample Date	Property Address
X01	7/23/03	744	38	S01	7/23/03	810/812 E. 151 st St
X02	7/23/03	609	33	S02	7/23/03	806 E. 151 st St.
X17	7/24/03	699	35	S05	7/24/03	Former RR, N. of 151st
X31	7/30/03	578	26	S10	7/30/03	4842 Kennedy
X41	7/31/03	1220	49	S13	7/31/03	Lot opposite 4937
X55	8/5/03	526+	35	S18	8/5/03	Former RR, S. of 148th
X56	8/5/03	584	35	S19	8/5/03	Former RR, S. of 149th
X77	8/7/03	714	29	S24	8/7/03	RR N of DuPont 2
X80	8/7/03	397	26	S25	8/7/03	4926 Grasselli

Notes: All the above samples are stored at USEPA Region 5's Central Regional Laboratory
 + = result stated is a mean of 2 replicates; error stated is highest error among 2 replicates

**TABLE 5. TYPES OF LABORATORY ANALYSES REQUESTED
USS LEAD VICINITY**

American Analytical and Technical Services	
Semi-quantitative scan for metals by modified Method 6020 and lead isotope ratios- fine fraction of <150 micron	
Semi-quantitative scan for metals by modified Method 6020 and lead isotope ratios- residual fraction of >150 micron	
Quantitative scan for selected metals* by Method 6020 - fine fraction of <150 micron	
Quantitative scan for selected metals* by Method 6020 - residual fraction of >150 micron	
Quantitative scan for selected metals* by Method 6020 for confirmation of the XRF data - bulk samples	
Laboratory for Environmental and Geological Studies	
Electron microprobe analysis - no sieving	

* The selected metals are:

Aluminum	Antimony	Arsenic	Barium
Beryllium	Cadmium	Chromium	Cobalt
Calcium	Copper	Iron	Lead
Manganese	Nickel	Selenium	Silver
Thallium	Tin	Zinc	Zirconium

TABLE 6.
FIELD PRECISION ASSESSMENT FOR XRF SAMPLING IN THE VICINITY OF USS LEAD REFINERY, INC.

PARAMETER	AVERAGE	STANDARD DEVIATION (SD)	RELATIVE SD
<i>Sampling date: 07/23/03; Precision on Sample from XRF Location X07, readings 37 - 43</i>			
Fe	12,800	642	5.03
Pb	869	49.5	5.70
Zn	621	53.5	7.97
<i>Sampling date: 07/24/03; Precision on Sample from XRF Location X12, readings 53 - 59</i>			
Fe	21,800	982	4.51
Pb	883	61.8	7.00
Zn	778	45.4	5.84
<i>Sampling date: 07/29//03; Precision on Sample from XRF Location X25, readings 10 - 16</i>			
Fe	9100	908	9.98
Pb	364	27.9	7.67
Zn	462	41.5	8.98
<i>Sampling date: 07/30/03; Precision on Sample from XRF Location X36, readings 49 - 55</i>			
Fe	16200	1675	10.32
Pb	549	145	26.51
Zn	988	103	10.45
<i>Sampling date: 07/31/03; Precision on Sample from XRF Location X46, readings 80 - 86</i>			
Fe	17400	916	5.27
Pb	459	18.3	3.99
Zn	639	17.8	2.86

TABLE 6.
FIELD PRECISION ASSESSMENT FOR XRF SAMPLING IN THE VICINITY OF USS LEAD REFINERY, INC.

PARAMETER	AVERAGE	STANDARD DEVIATION (SD)	RELATIVE SD
<i>Sampling date: 08/05/03; Precision on Sample from XRF Location X50, readings 96 - 102</i>			
Fe	16400	809	5.0
Pb	736	35	4.7
Zn	1060	41	3.9
<i>Sampling date: 08/06/03; Precision on Sample from XRF Location X66, readings 15 - 21</i>			
Fe	19300	1090	5.6
Pb	592	13	2.2
Zn	1091	43	4.0
<i>Sampling date: 08/07/03; Precision on Sample from XRF Location X79, readings 42 - 48</i>			
Fe	18700	690	3.7
Pb	1624	21	1.3
Zn	1913	39	2.0
<i>XRF Analysis date: 08/10/03; Precision on Sample from XRF Location X78, readings 61 - 67</i>			
Fe	6516	419	6.4
Pb	583	30	5.1
Zn	1541	100	6.5

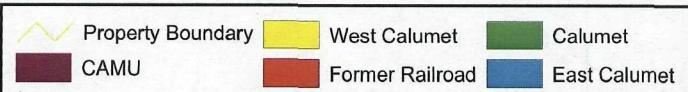
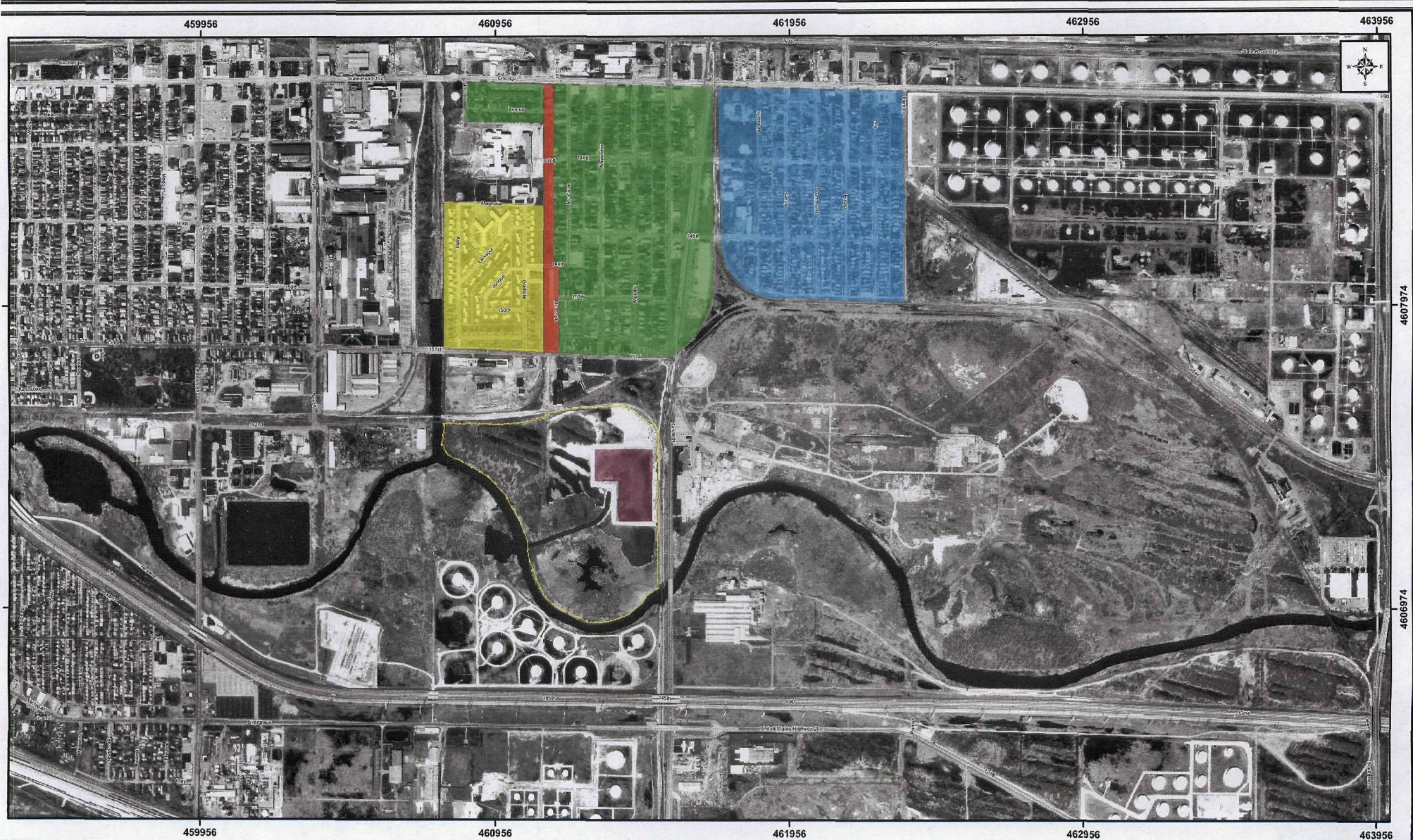


Figure 1
Site Vicinity
East Chicago, Indiana

0 0.25 0.5 Miles
0 0.5 1 Kilometers



Last Updated 10-22-2003

Figure 2a
Historical Sampling
USS Lead MRFI and DuPont



- Property Boundary
- Facilities
- Sample Locations (Historical)**
- ▲ EPA Soil Survey (U.S. EPA, 1985)
- 1992 Lead Results (DuPont, 2001) (4x)
- RFI 1999 Results (DuPont, 2001) (4x)
- ▲ Baseline Assessment 2000 (DuPont, 2001) (4x)
- MRFI - Enlact (USS Lead, 1999)
- MRFI - Geochemical Solutions (USS Lead, 2001)
- New Samples (July 2002)**
- Soil (4x)
- Wetland (2x)

Note:
All sample units are mg/kg.
Sample locations designated with a "4x" were factored by four to ease comparison of these 0-24 inch sampling results with 0-6 inch surface sampling results.
Samples not labeled indicate concentrations = 0.00 mg/kg.
Sample locations that are not labeled indicate non-detectable lead concentrations.

Wetland Samples were factored by "4x" to account for depth and dilution for surface concentrations.
Soil Samples were factored by "2x" to account for depth and dilution for surface concentrations.
Aerial date 1998.

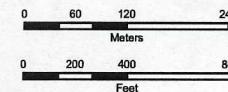
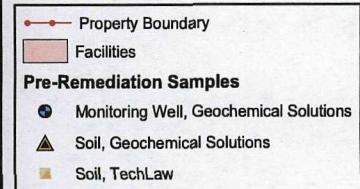
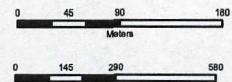


Figure 2b
Historical Sampling
USS Lead ISM Characterization



Note:
All sample units are mg/kg.
Sample locations designated with a "4x" were factored by four to ease comparison of these 0-24 inch sampling results with 0-6 inch surface sampling results.
Samples not labeled indicate concentrations = 0.00 mg/kg.
Sample locations that are not labeled indicate non-detectable lead concentrations.

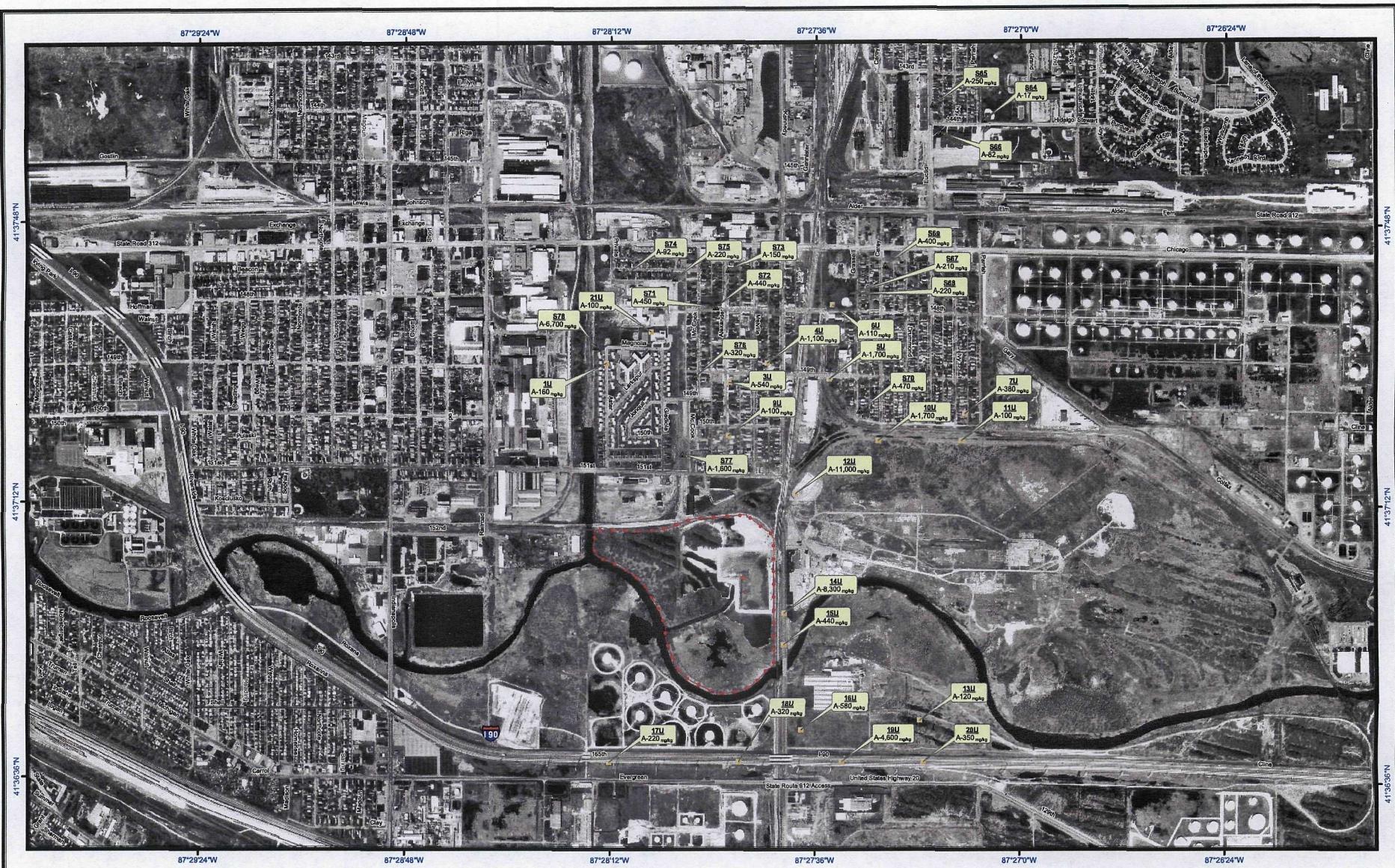
Wetland Samples were factored by "4x" to account for depth and dilution for surface concentrations.
Soil Samples were factored by "2x" to account for depth and dilution for surface concentrations.
Aerial date 1998.



Prepared By:

TechLaw, Inc.

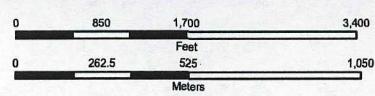


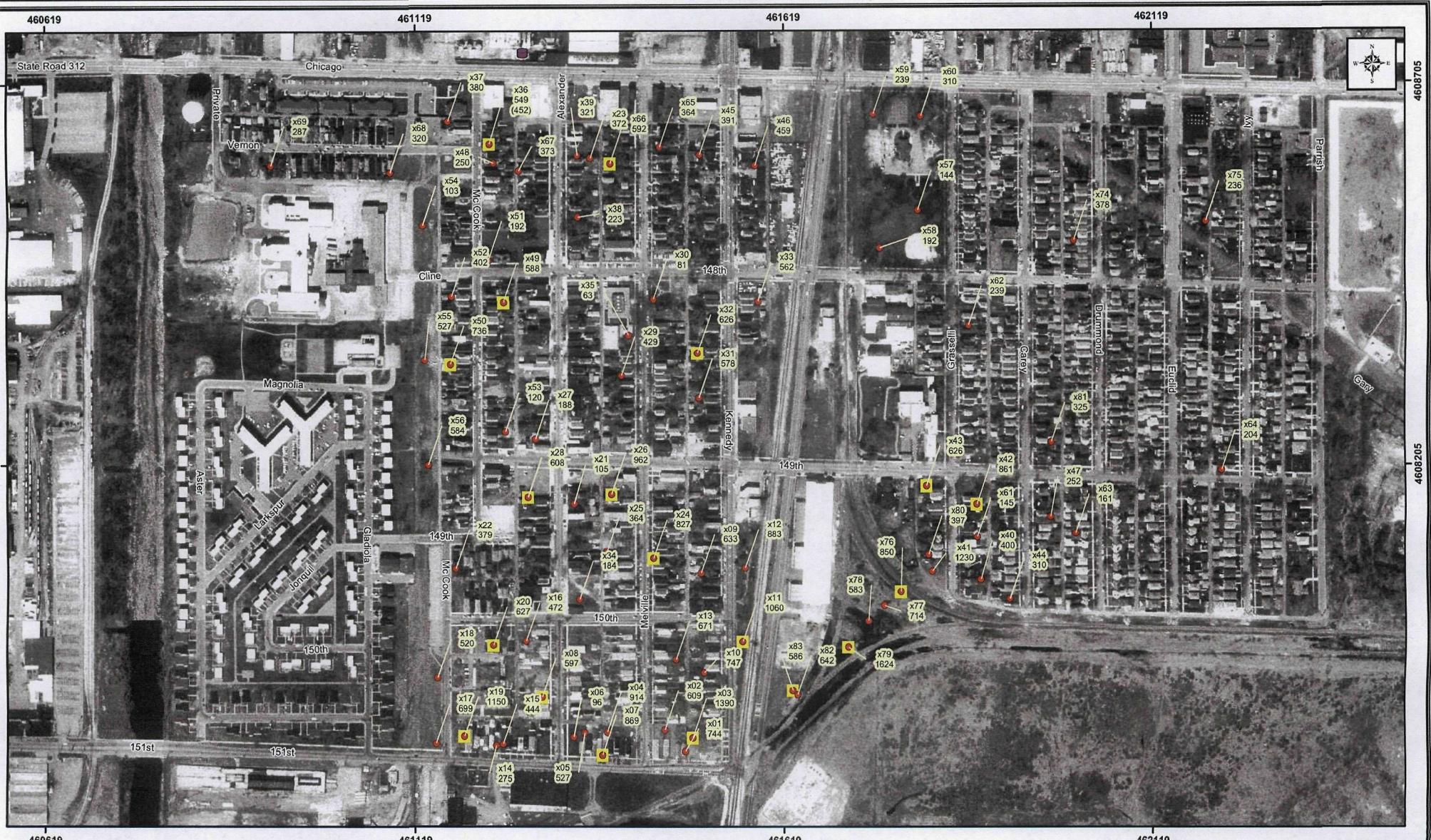


Notes:
 Sample Depth Intervals
 A = 0 - 6 inches
 B = 6 - 12 inches
 C = 12 - 18 inches
 D = 18 - 24 inches
 E = > 24 inches
 Arial Source: USGS
 Arial Date: April 12, 1998

Figure3
Historical Sampling
USEPA and IDEM

- EPA Soil Survey (U.S. EPA, 1985)
- ▲ IDEM/Superfund Soil Sampling Project, 2002
- Property Boundary
- Blast Furnace





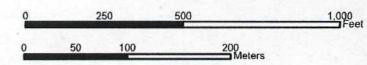
Sample Period July 23 - August 7, 2003

- Stack from US Reduction
- Sample Results (Lead ppm)
- Samples Subject to Lab Analysis

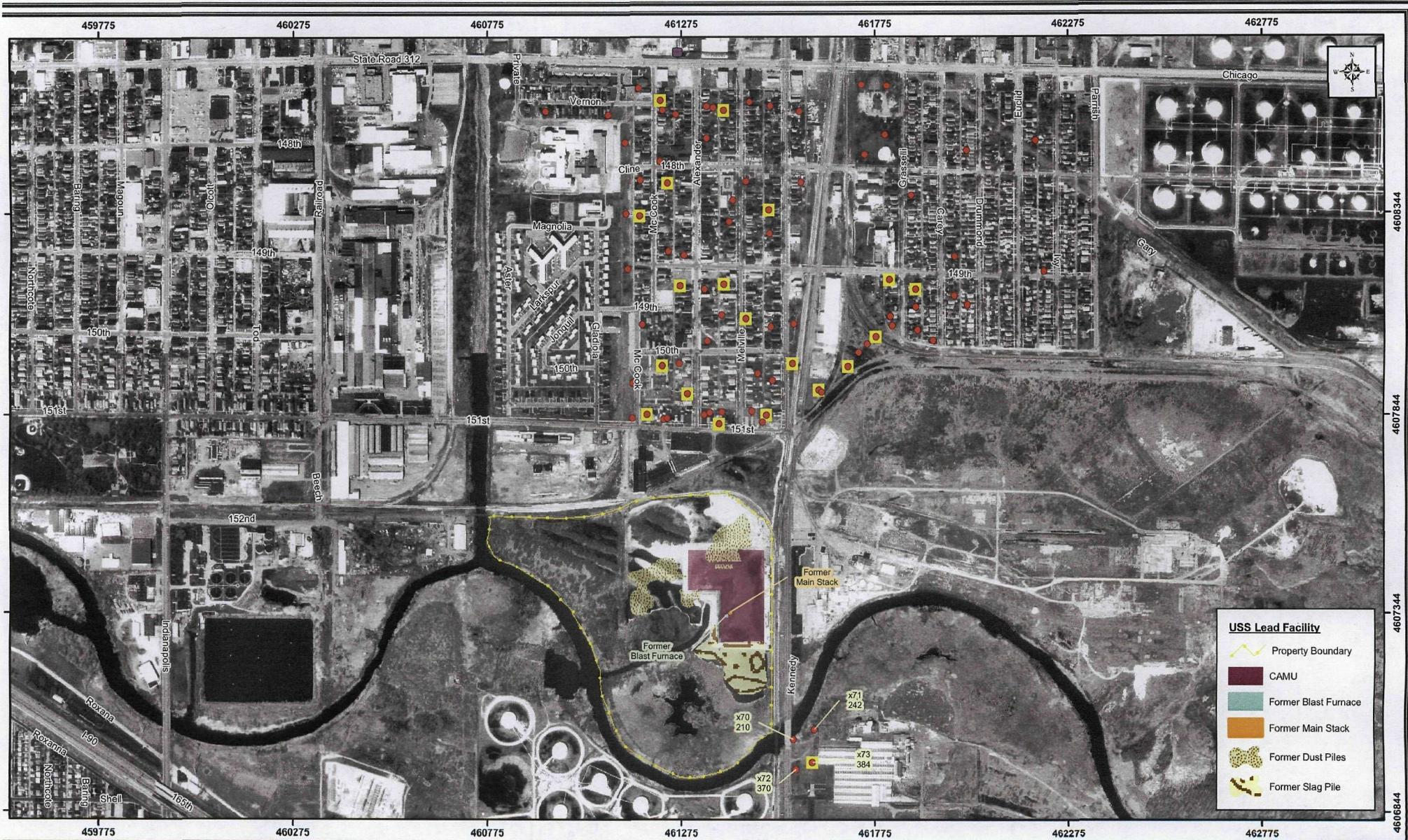
Figure 4a
Lead XRF Results
Resco, Hammond, IN

Note:
Aerial Date April 12, 1998
USGS 1998 Digital Orthophoto Quarter Quadrangle (DOQQ)

Average Sample Results
The concentrations presented for locations X07, X12, X25, X36, X46, X50, X66, X78 and X79 represent the calculated averages from 7 readings from Sample X36 includes both the maximum and the average results in parenthesis.



Last Updated 10-22-2003



Sample Period July 23 - August 7, 2003

- Stack from US Reduction
- Sample Results (Lead ppm)
- Samples Subject to Lab Analysis

Figure 4b
Lead XRF Results
Calumet and East Calumet Neighborhoods

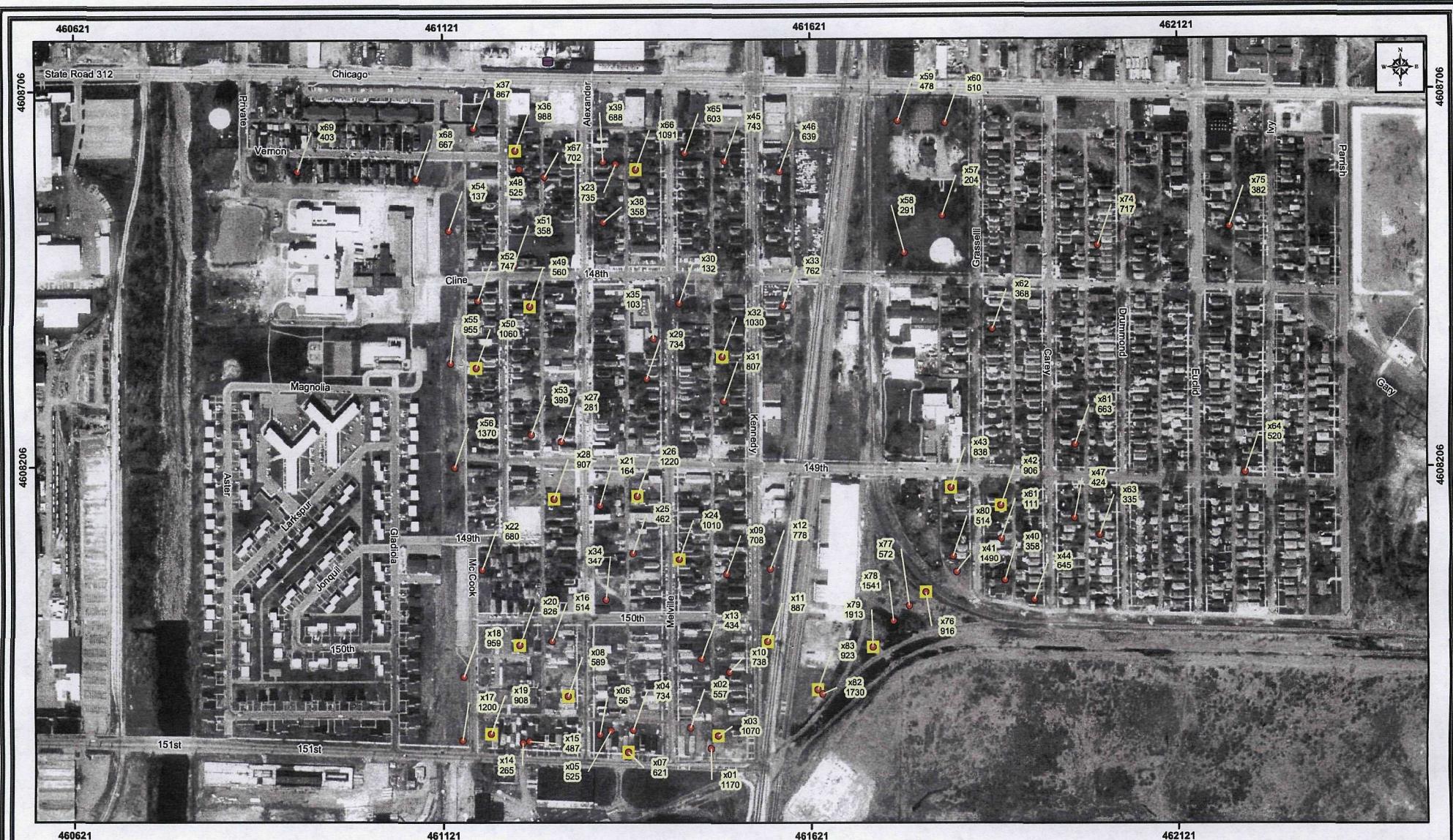
Note:
Aerial Date April 12, 1998
USGS 1998 Digital Orthophoto Quarter Quadrangle (DOQQ)
Average Sample Results
The concentrations presented for locations X07, X12, X25, X36, X46, X50, X66, X78 and X79 represent the calculated average from 7 readings from the precision assessment.

0 500 1,000 2,000
Feet

0 100 200 400
Meters



Last Updated 10-22-2003



Sample Period July 23 - August 7, 2003

- Stack from US Reduction
- Sample Results (Zinc ppm)
- Samples Subject to Lab Analysis

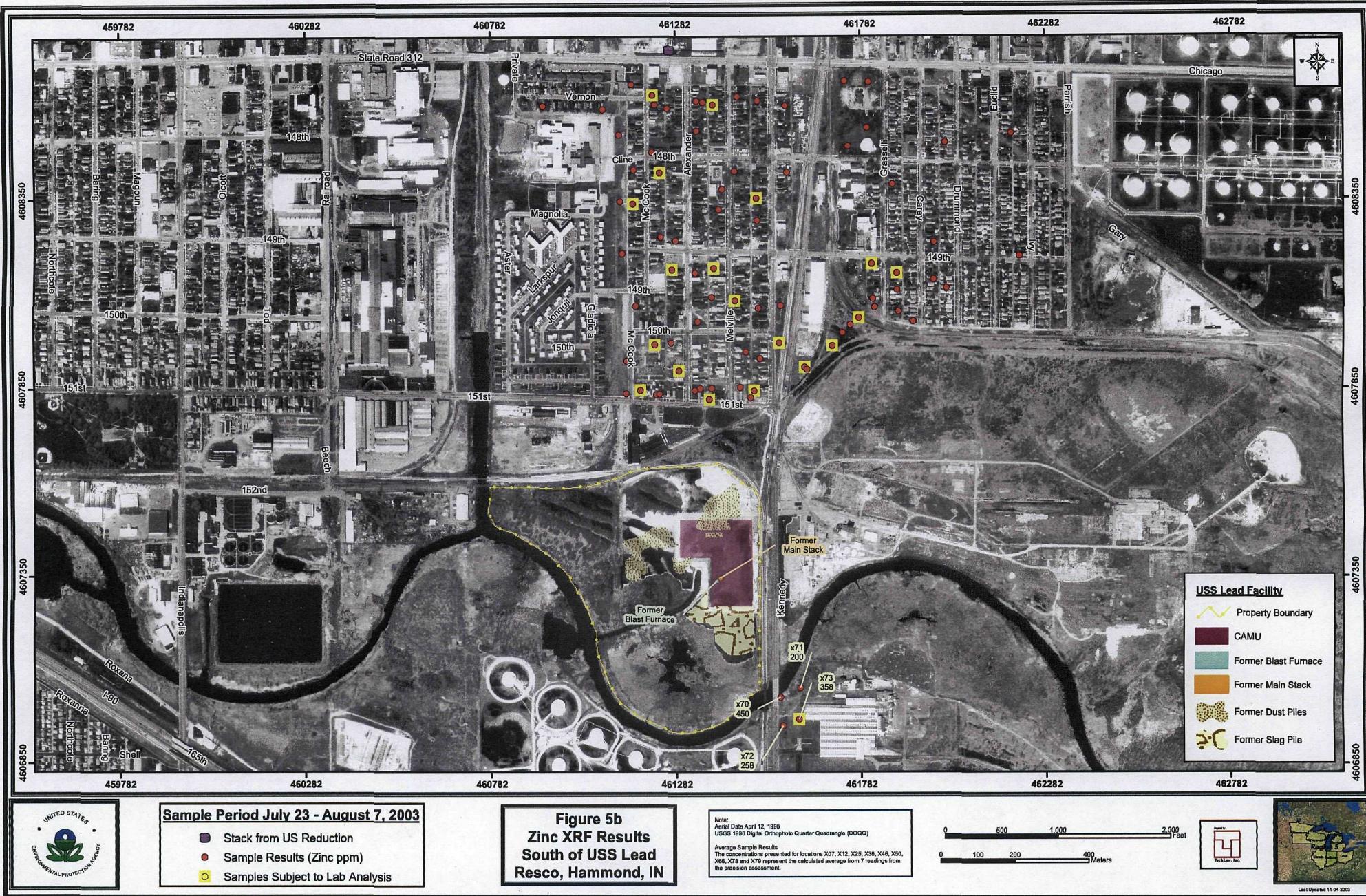
Figure 5a
Zinc XRF Results
Calumet and East Calumet
Neighborhoods

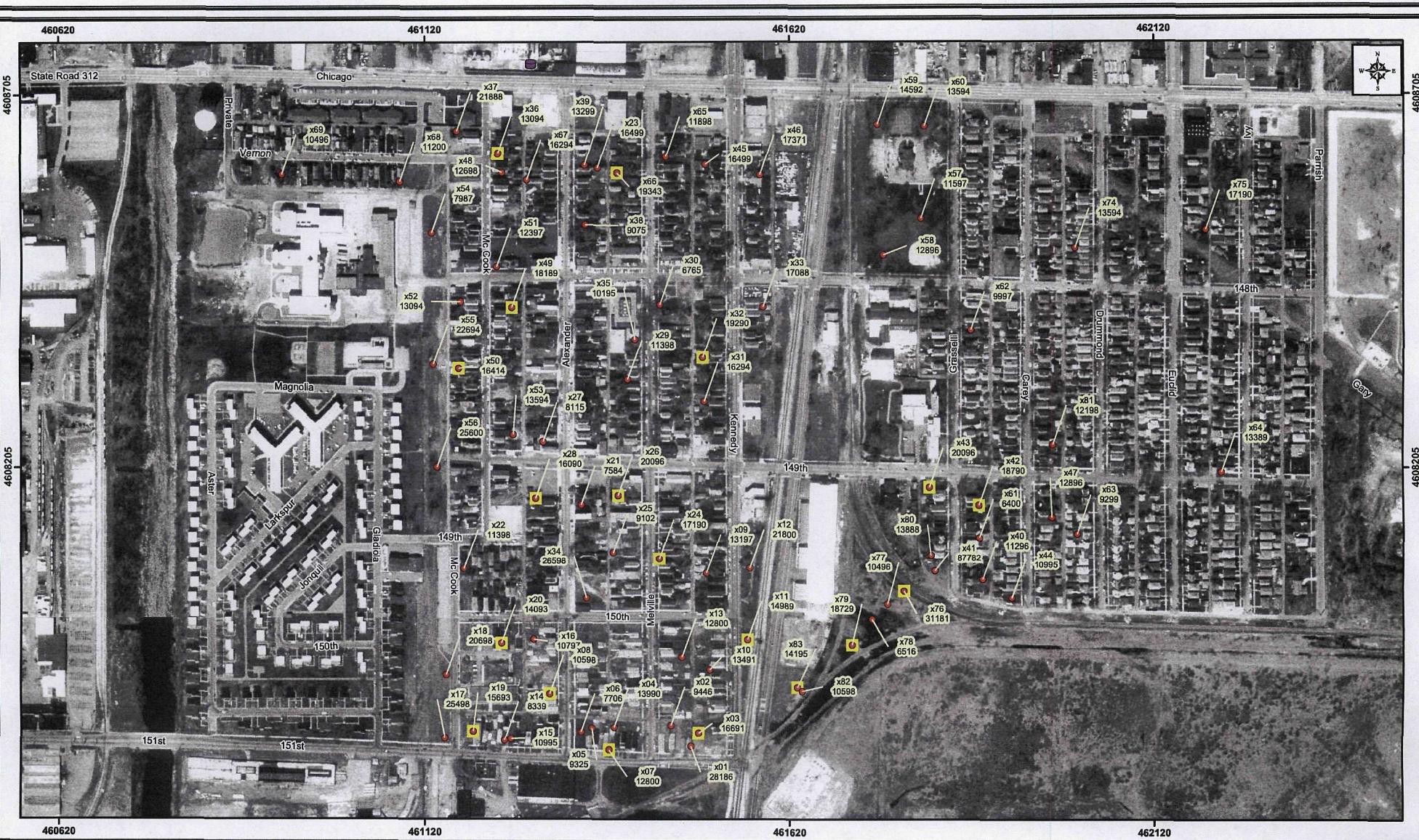
Note:
April 12, 1998
USGS 1998 Digital Orthophoto Quarter Quadrangle (DOQQ)
Average Sample Results
The concentrations presented for locations X07, X12, X25, X36, X46, X50, X68, X78 and X79 represent the calculated average from 7 readings from the precision assessment.

0 250 500 1,000
Feet
0 50 100 200
Meters



Last Updated 11-04-2003





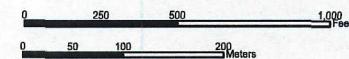
Sample Period July 23 - August 7, 2003



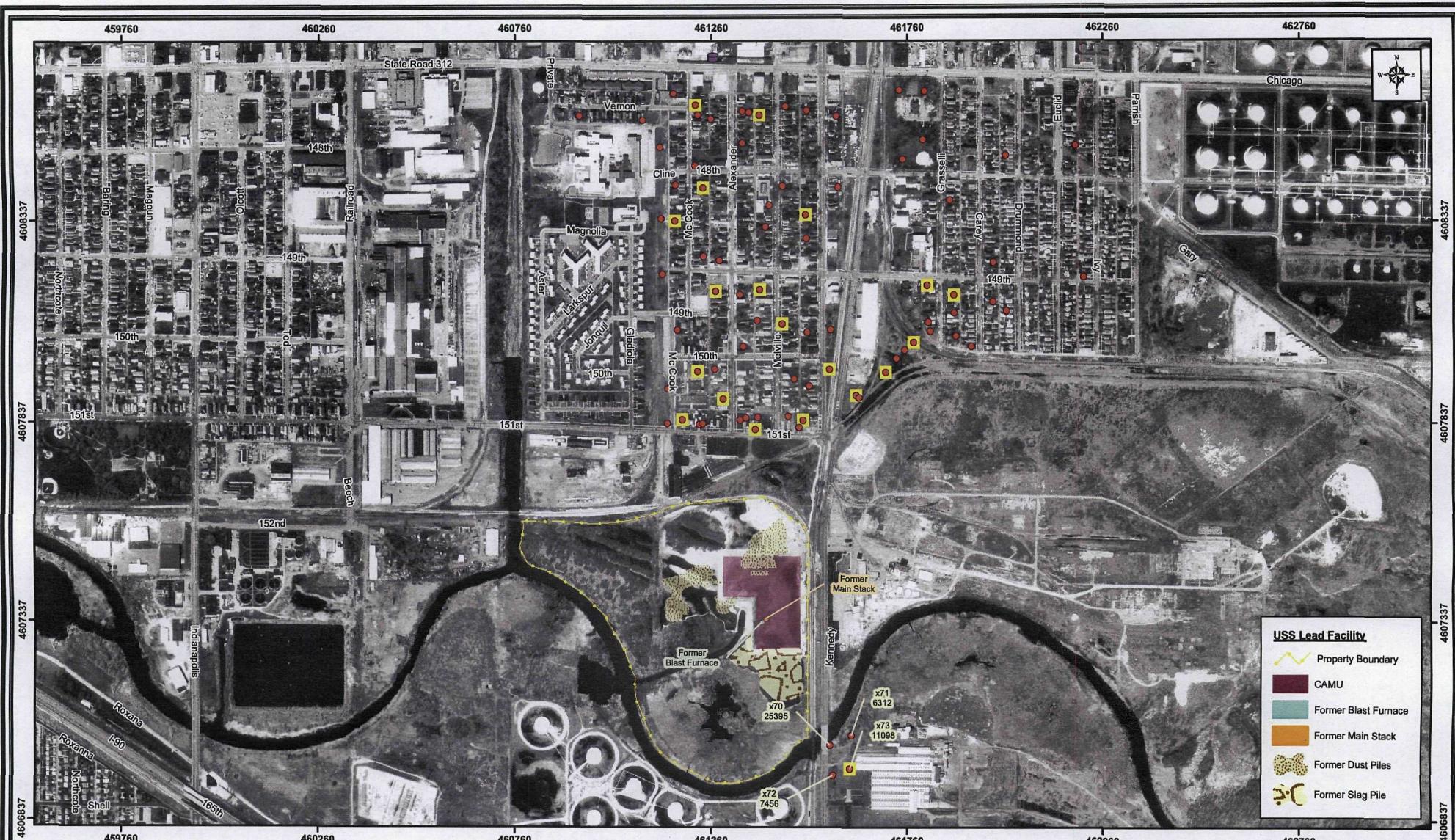
- Stack from US Reduction
- Sample Results (Iron ppm)
- Samples Subject to Lab Analysis

Figure 6a
Iron XRF Results
Calumet and East Calumet
Neighborhoods

Note:
Aerial Date April 12, 1998
USGS 1998 Digital Orthophoto Quarter Quadrangle (DOQQ)
Average Sample Results
The concentrations presented for locations X07, X12, X25, X36, X46, X50, X58, X78 and X79 represent the calculated average from 7 readings from the precision assessment.



Last Updated 11-04-2003



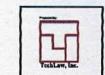
Sample Period July 23 - August 7, 2003

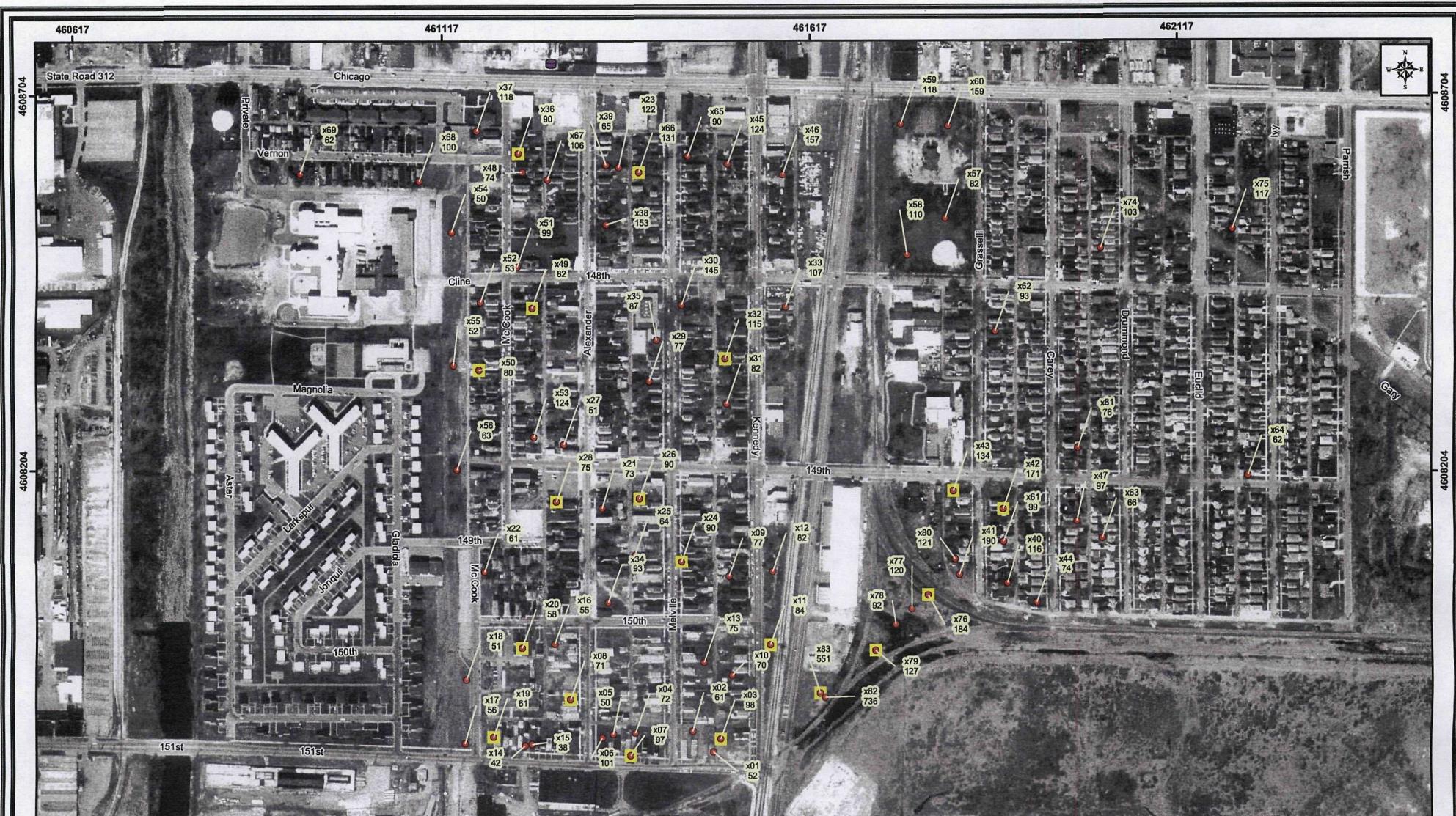
- Stack from US Reduction
- Sample Results (Iron ppm)
- Samples Subject to Lab Analysis

Figure 6b
Iron XRF Results
South of USS Lead Resco, Hammond, IN

Note:
Aerial Date April 12, 1998
USGS 1998 Digital Orthophoto Quarter Quadrangle (DOQQ)
Average Sample Results
The concentrations presented for locations X07, X12, X25, X36, X46, X50, X66, X78 and X79 represent the calculated average from 7 readings from the precision assessment.

0 500 1,000 2,000
Feet
0 100 200 400
Meters





Sample Period July 23 - August 7, 2003

- Stack from US Reduction
- Sample Results (Zirconium ppm)
- Samples Subject to Lab Analysis

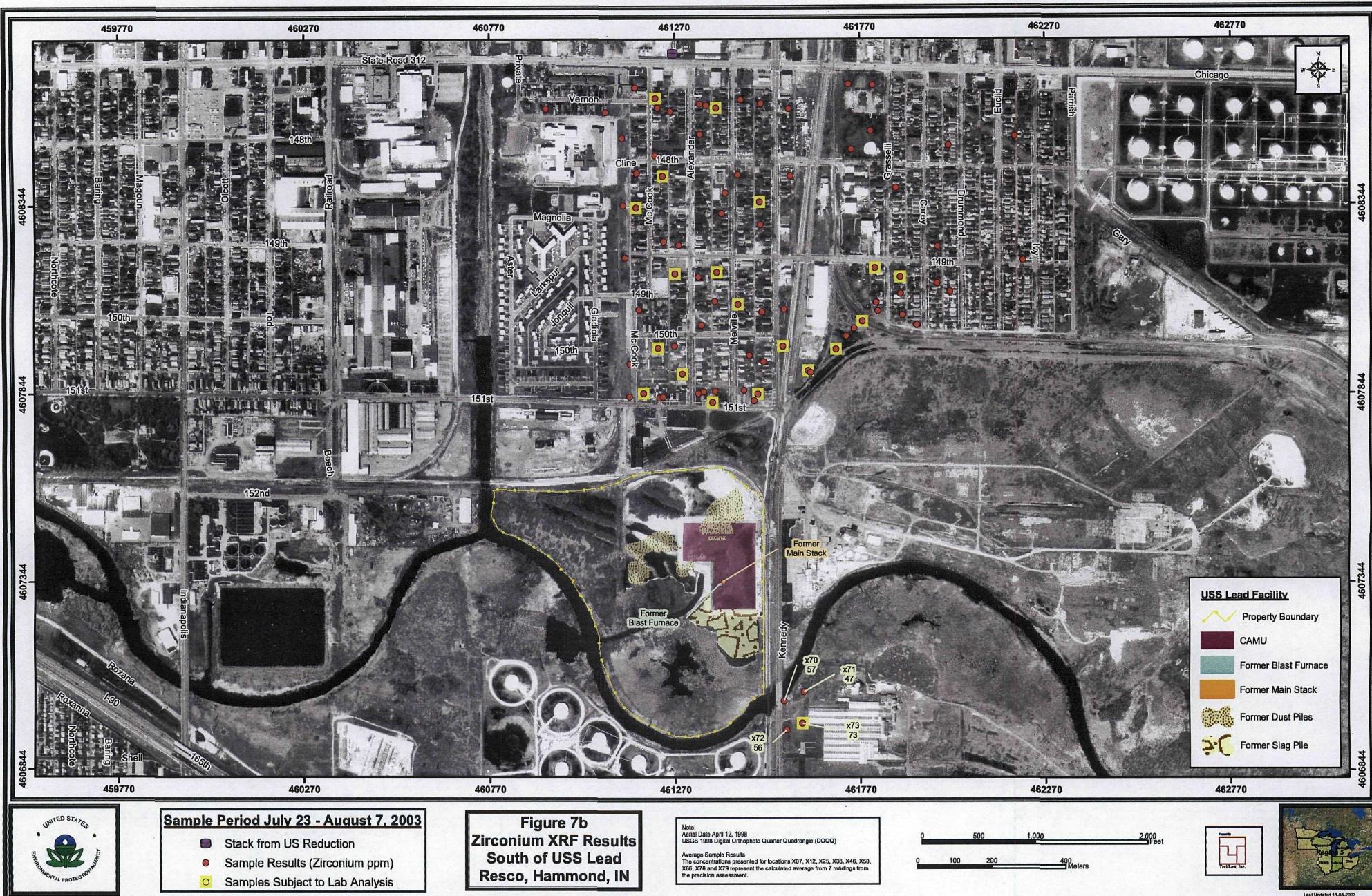
Figure 7a
Zirconium XRF Results
Calumet and East Calumet
Neighborhoods

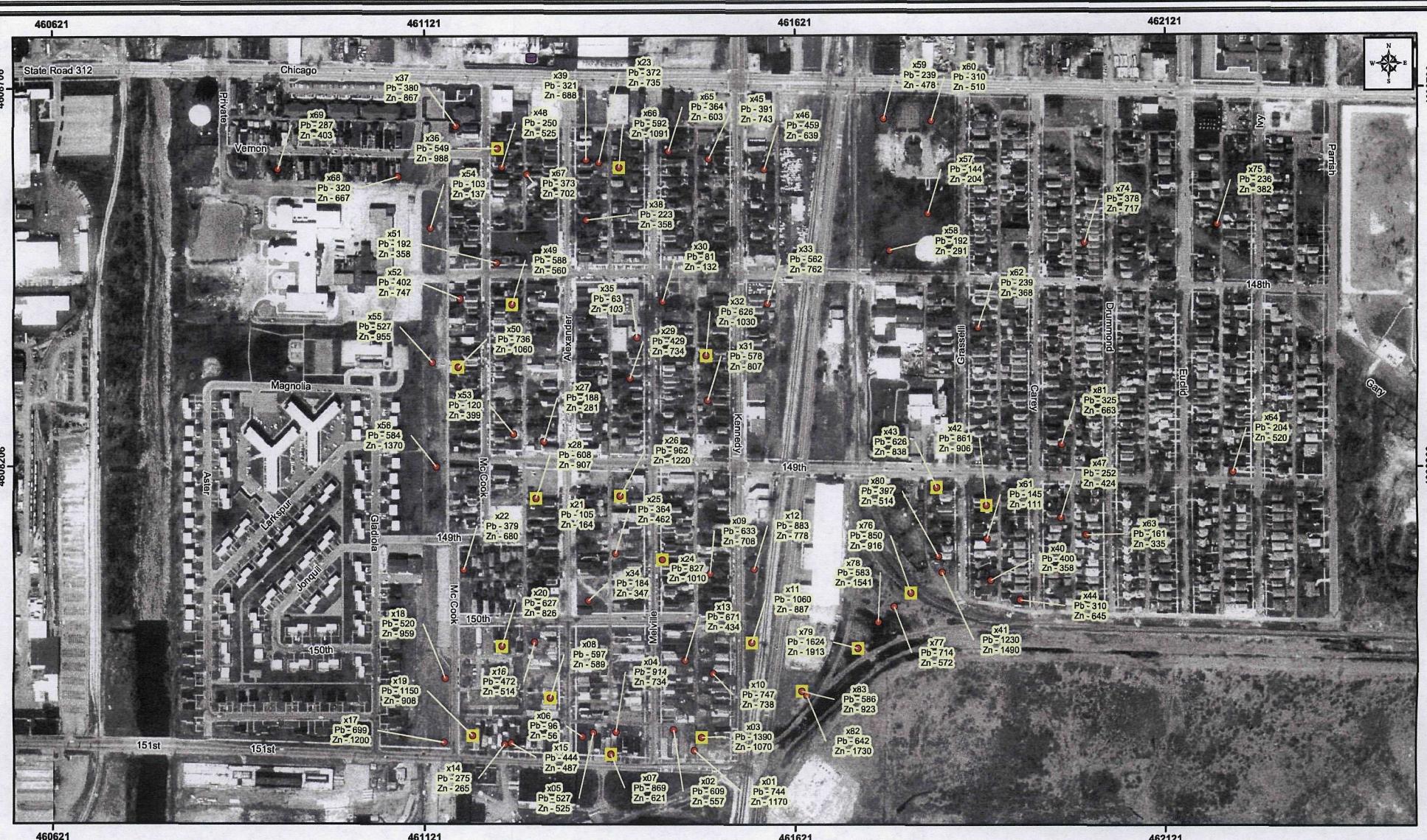
Note:
Aerial Date April 12, 1998
USGS 1998 Digital Orthophoto Quarter Quadrangle (DOQQ)
Average Sample Results
The concentrations presented for locations X07, X12, X25, X36, X46, X50, X66, X78 and X79 represent the calculated average from 7 readings from the precision assessment.

0 250 500 1,000
Feet
0 50 100 200
Meters



Last Updated 11-04-2003



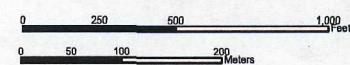


Sample Period July 23 - August 7, 2003

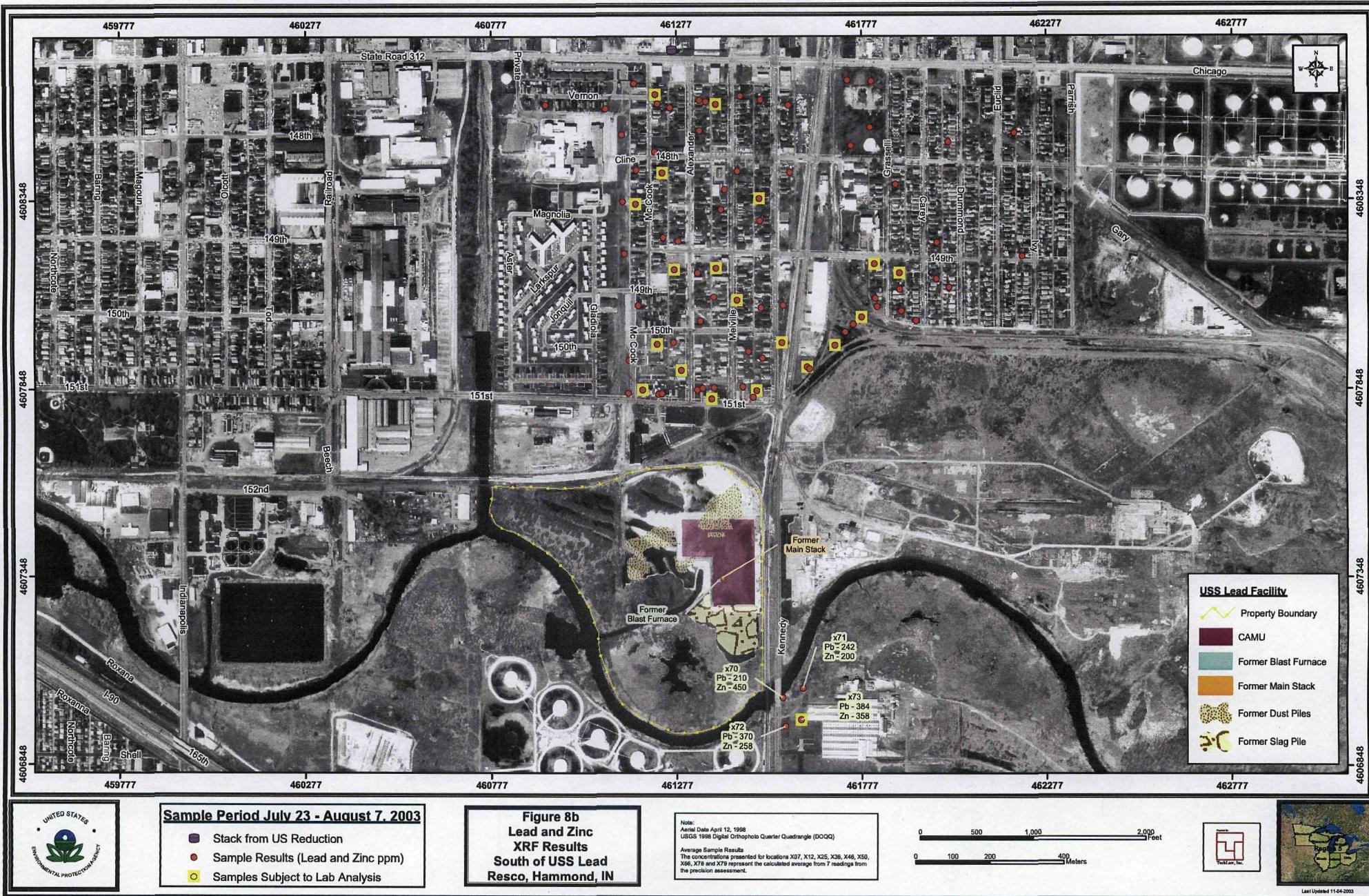
- Stack from US Reduction
- Sample Results (Lead and Zinc ppm)
- Samples Subject to Lab Analysis

Figure 8a
Lead and Zinc
XRF Results
Calumet and East Calumet
Neighborhoods

Note:
Aerial Date April 12, 1998
USGS 1998 Digital Orthophoto Quarter Quadrangle (DOQQ)
Average Sample Results
The concentration presented for locations X07, X12, X25, X36, X46, X50, X68, X78 and X79 represent the calculated average from 7 readings from the precision assessment.



Last Updated 11-04-2003



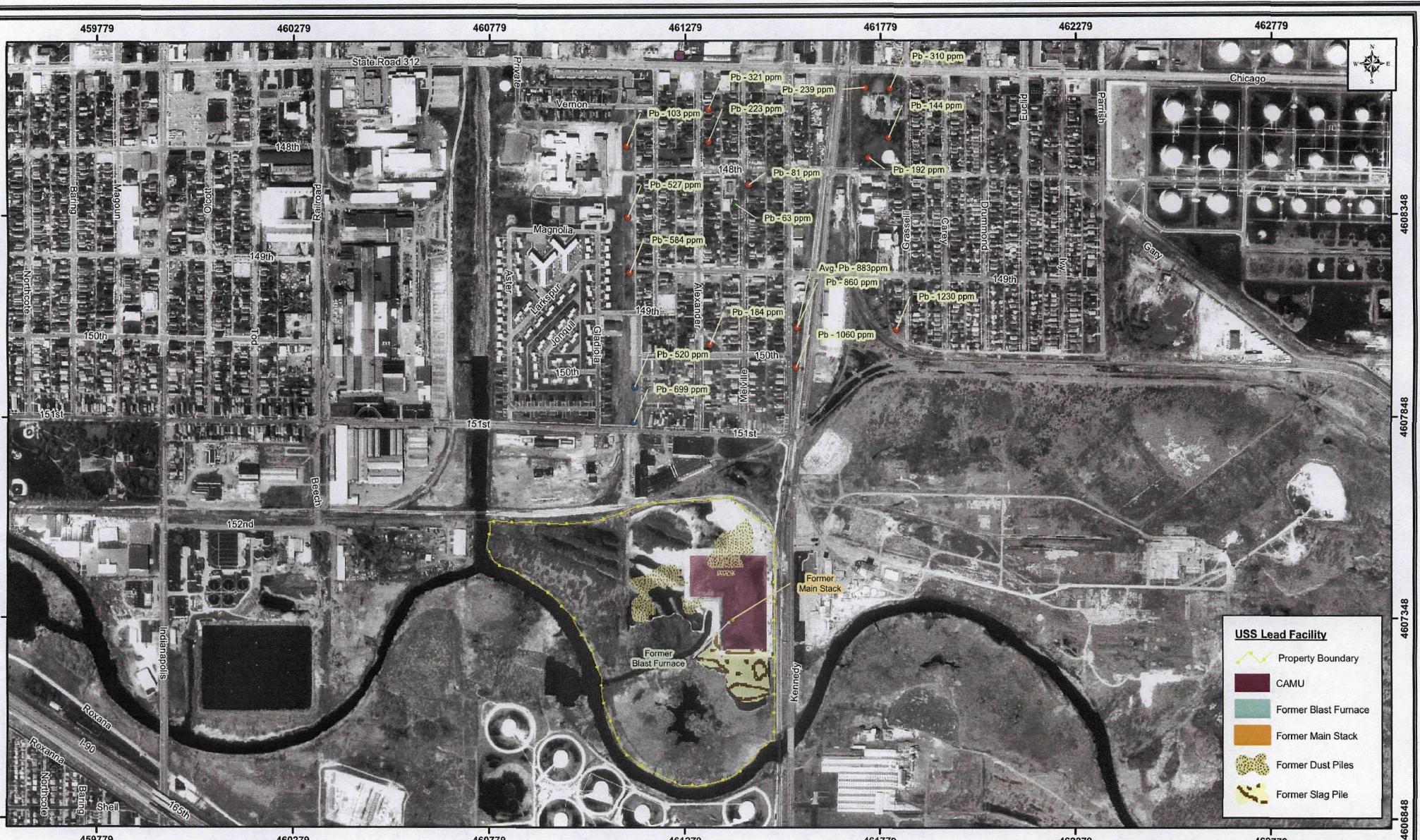


Figure 9
Locations and Pb Results of
XRF Samples on City of
East Chicago Property

Note:
Aerial Date April 12, 1998
USGS 1998 Digital Orthophoto Quarter Quadrangle (DOQQ)
Average Sample Result
Avg. Pb result represents the calculated average from 7 readings from the precision assessment.

0 500 1,000 2,000
Feet
0 100 200 400
Meters

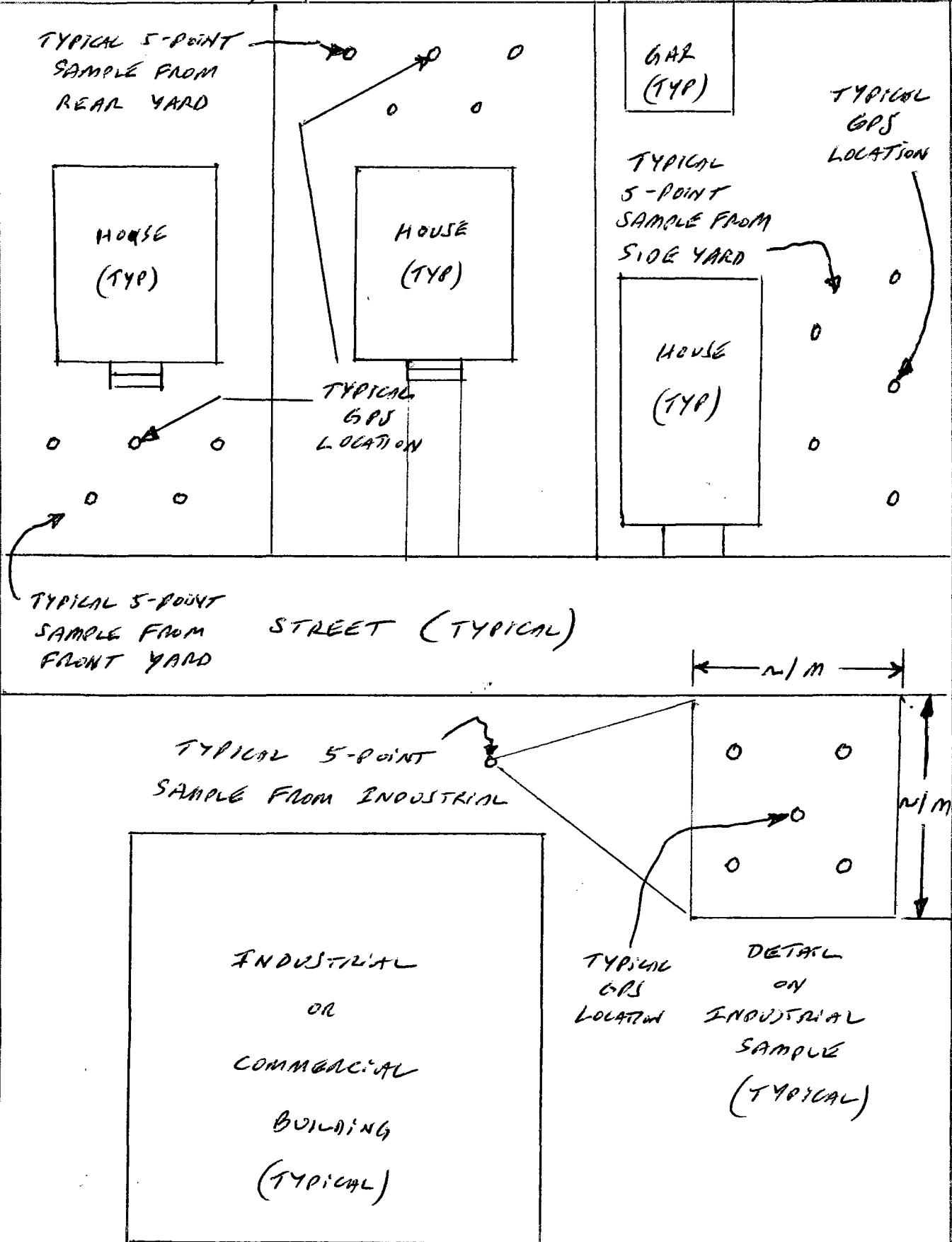


Last Updated 10-22-2003

REPORT ON XRF STUDY
USS LEXICO VICINITY

FIGURE 10—
SOIL SCREENING PROC.

22-141 15 SHEETS
22-142 100 SHEETS
22-144 200 SHEETS



APPENDIX A
ACCESS/CONSENT FORMS

RECEIVED

MAR 11 2008

DEPARTMENT OF
ENVIRONMENTAL MANAGEMENT
OFFICE OF LAND QUALITY

APPENDIX B
LOG OF PHOTOGRAPHS & PHOTOGRAPHS

APPENDIX C
CHAIN OF CUSTODY FORMS

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME Vicinity of USS Lead					NO. OF CONTAINERS						Activity Code:		
03RM02							Analite: 602017C725							
SAMPLERS: (Print Name and Sign) Meredith Capriro														
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION							TAG NUMBERS		
SZ9	8/21/03	10:55	X		605 E. 50 th St (X20)		1 ✓					SHIPPED OUT		
Relinquished by: (Signature)			Date / Time		Received by: (Signature)							Ship To:		
<i>John Spie</i>			8/21/03 15:41		<i>William Sy</i>		18/21/03 15:41					American American Technical Services		
Relinquished by: (Signature)			Date / Time		Received by: (Signature)		8/28/03 14:15					ATTN:		
<i>William Sy</i>			8/28/03 14:15		<i>Ame Molsinek</i>							Airbill Number		
Relinquished by: (Signature)			Date / Time		Received for Laboratory by: (Signature)			Date / Time		Chain of Custody Seal Numbers 10890				

Distribution: White - Accompanies Shipment; Pink - Coordinator Field Files; Yellow - Laboratory File



CHAIN OF CUSTODY RECORD

Distribution: White - Accompanies Shipment; Pink - Coordinator Field Files; Yellow - Laboratory File



CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME				NO. OF CONTAINERS	Analyte: S-20 METRO						Activity Code:
03RM02	USS LEAD VICINITY											
SAMPLERS: (Print Name and Sign)												
John Waller		Michelle Moulton		MICHIGAN CITY								
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION		TAG NUMBERS					
S20	8/6	1230	<input checked="" type="checkbox"/>		4726 MELVILLE (X66)		1	<input checked="" type="checkbox"/>				85243 SHIPPED OUT
S21	8/7	1025	<input checked="" type="checkbox"/>		RA X76		1	<input checked="" type="checkbox"/>				85243 SHIPPED OUT
S22	8/7	1600	<input checked="" type="checkbox"/>		RAESCO X73		1	<input checked="" type="checkbox"/>				85243 SHIPPED OUT
S23	8/7	1025	<input checked="" type="checkbox"/>		RA X79		1	<input checked="" type="checkbox"/>				85246 SHIPPED OUT
S24	8/7	1215	<input checked="" type="checkbox"/>		RA X77		1	<input checked="" type="checkbox"/>				85246 SAMPLE SOURCE AT CCL
S25	8/7	1430	<input checked="" type="checkbox"/>		4926 GRASSELI		1	<input checked="" type="checkbox"/>				85246 PPN RCRA INSTRUCTIONS 8128103 200
Relinquished by: (Signature)		Date / Time		Received by: (Signature)							Ship To:	AMERICAN ANALYTICAL & TECHNICAL SERVICES
<i>John Waller</i>		8/7/03 1715		<i>William S. L.</i>		8/7/03 1715					ATTN:	
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		8/28/03					Airbill Number	
<i>William S. L.</i>		8/28/03 14:16		<i>Amber Molsinger</i>		14:16					Chain of Custody Seal Numbers 85243, 85246	
Relinquished by: (Signature)		Date / Time		Received for Laboratory by: (Signature)		Date / Time						

Distribution: White - Accompanies Shipment; Pink - Coordinator Field Files; Yellow - Laboratory File



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5-43656

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME <i>WSS LENS VICINITY</i>				NO. OF CONTAINERS	Analyst: <i>6020 Motsinger</i>							Activity Code:	
SAMPLERS: (Print Name and Sign) <i>Micheal M. Motsinger</i> <i>MINITAB CAP. 600</i>														
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION		TAG NUMBERS							
S16	8/5/03	09:10	<input checked="" type="checkbox"/>		4807 McCook (X49)		1	<input checked="" type="checkbox"/>						SHIPPED OUT
S17	8/5/03	10:40	<input checked="" type="checkbox"/>		4830 McCook (X50)		1	<input checked="" type="checkbox"/>						SHIPPED OUT
<input checked="" type="checkbox"/> S18	8/5/03	12:35	<input checked="" type="checkbox"/>		FMR RR (X55)		1	<input checked="" type="checkbox"/>						SAMPLE STORED AT CORE PON
<input checked="" type="checkbox"/> S19	8/5/03	13:35	<input checked="" type="checkbox"/>		FMR RR (X56)		1	<input checked="" type="checkbox"/>						RCRA INSTRUCTION 8/28/03 WTR
Relinquished by: (Signature) <i>William J. Motsinger</i>		Date / Time 8/5/03 17:15		Received by: (Signature) <i>William J. Motsinger</i>		8/5/03 17:20		Ship To: <i>AMERICAN ANALYTICAL</i> <i>TECHNICAL SERVICES</i>						
Relinquished by: (Signature) <i>William J. Motsinger</i>		Date / Time 8/28/03 14:16		Received by: (Signature) <i>James Motsinger</i>		8/28/03 14:16		ATTN: Airbill Number						
Relinquished by: (Signature)		Date / Time		Received for Laboratory by: (Signature)		Date / Time		Chain of Custody Seal Numbers <i>10805</i>						

Distribution: White - Accompanies Shipment; Pink - Coordinator Field Files; Yellow - Laboratory File



CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME					NO. OF CONTAINERS	Activity Code: <i>ANALYSIS</i>
03RMOZ	USS LEAD VICINITY						
SAMPLERS: (Print Name and Sign)							
<i>MICHAEL MURRAY</i> <i>MIRTHA CAIRO</i>							
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	TAG NUMBERS	
S13	7/31	1025	X		VACANT LOT - GRASSELLI (X41)	✓	<i>SAMPLES STORED AT COLD PON RECD INSTRUMENT 812813</i>
S14	7/31	1110	X		4907 GRASSELLI (X42)	✓	<i>SHIPPED OUT</i>
S15	7/31	1145	X		4904 CANSAVE (X43)	✓	<i>SHIPPED OUT</i>
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		7/31/03	Ship To: AMERICAN ANALYTICAL
<i>Wm Murray</i>		7/31/03 1715		<i>William L. Murray</i>		17:16	
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		8/28/03	ATTN:
<i>William L. Murray</i>		8/28/03 14:17		<i>Mike Motsinger</i>		14:17	
Relinquished by: (Signature)		Date / Time		Received for Laboratory by: (Signature)		Date / Time	Airbill Number
Chain of Custody Seal Numbers <i>10809</i>							

Distribution: White - Accompanies Shipment; Pink - Coordinator Field Files; Yellow - Laboratory File



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5-43651

ENVIRONMENTAL PROTECTION AGENCY
Office of Enforcement

CHAIN OF CUSTODY RECORD

**77 West Jackson Boulevard
Chicago, Illinois 60604**

Distribution: White - Accompanies Shipment; Pink - Coordinator Field Files; Yellow - Laboratory File



Printed on Recycled Paper/Printed with Soy-Based Ink

5-43649

CHAIN OF CUSTODY RECORD

Distribution: White - Accompanies Shipment; Pink - Coordinator Field Files; Yellow - Laboratory File



CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME					NO. OF CONTAINERS						Activity Code:			
03RM02	WSS LEAD VICINITY						Analyte: 6020 mg/L								
SAMPLERS: (Print Name and Sign)															
MICHAEL Motsinger William Motzinger															
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION		TAG NUMBERS								
✓ S04	7/24/03	1036	X		X11 - KENNEDY GARDENS CANAL		1	✓	SHIPPING OUT						
S05	7/24/03	1445	X		X17 - FMA ON PROPERTY		1	✓	SAMPLE STORED AT GALL PON RIVER INSTRUCTION 8128103 20						
✓ S06	7/24/03	1515	X		X19 - 506 E 151 ST ST		1	✓	SHIPPING OUT						
Relinquished by: (Signature)			Date / Time		Received by: (Signature)		7/24/03		Ship To:			AMERICAN ANALYTICAL & RECH			
William Motzinger			7/24/03 17:11		William Motzinger		17:11								
Relinquished by: (Signature)			Date / Time		Received by: (Signature)		8/28/03		ATTN:						
William Motzinger			8/28/03 14:18		Anne Motzinger		14:18								
Relinquished by: (Signature)			Date / Time		Received for Laboratory by: (Signature)		Date / Time		Airbill Number						
Chain of Custody Seal Numbers 12307															

Distribution: White - Accompanies Shipment; Pink - Coordinator Field Files; Yellow - Laboratory File



Printed on Recycled Paper/Printed with Soy-Based Ink

5-43648

CHAIN OF CUSTODY RECORD

Distribution: White - Accompanies Shipment; Pink - Coordinator Field Files; Yellow - Laboratory Files



CHAIN OF CUSTODY RECORD

PROJ. NO. 03RM02	PROJECT NAME Vicinity of USS <i>Illinoi</i>					NO. OF CONTAINERS	Analyte: EMPA						Activity Code: []	
SAMPLERS: (Print Name and Sign) Alfredo Capino [Signature]														
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION		TAG NUMBERS							
529	8/21/03	10:55	X		605 E. 150 th ST (x20)		1	✓						
Relinquished by: (Signature) <i>John Wilson</i>			Date / Time 8/21/03 15:40	Received by: (Signature) <i>William L. Motsinger</i>			Date / Time 8/21/03 15:40			Ship To: Laboratory for Environmental & Geological Studies				
Relinquished by: (Signature) <i>William L. Motsinger</i>			Date / Time 8/28/03 14:20	Received by: (Signature) <i>Anne Motsinger</i>			Date / Time 8/28/03 14:20			ATTN:				
Relinquished by: (Signature) []			Date / Time	Received for Laboratory by: (Signature)			Date / Time	Airbill Number						
Distribution: White - Accompanies Shipment; Pink - Coordinator Field Files; Yellow - Laboratory File													Chain of Custody Seal Numbers 10891	



CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME <i>USS Lead Vicinity</i>					NO. OF CONTAINERS							Activity Code: <input type="text"/>
03RM02	SAMPLERS: (Print Name and Sign) <i>MIRNA Capizzi, Delta Baffo</i>						<i>Analyze: CRMA</i>						
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION		TAG NUMBERS						
S26	8/12	16:40	✓		74 E 15 th St (X07)		1	✓					
S27	8/12	17:00	✓		5028 Alexander Ave (X08)		1	✓					
S28	8/12	17:20	✓		CME South (X03)		1	✓					
Relinquished by: (Signature) <i>Athenia Capizzi</i>					Date / Time <i>8/13/03 9:49</i>	Received by: (Signature) <i>William Sy</i>	Ship To: <i>Laboratory for Environmental Quality Studies</i>						
Relinquished by: (Signature) <i>William Sy</i>					Date / Time <i>8/28/03 14:21</i>	Received by: (Signature) <i>Mike Motsinger</i>	ATTN: Airbill Number						
Relinquished by: (Signature)					Date / Time	Received for Laboratory by: (Signature)	Date / Time	Chain of Custody Seal Numbers <i>10893</i>					
Distribution: White - Accompanies Shipment; Pink - Coordinator Field Files; Yellow - Laboratory File													



CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME					NO. OF CONTAINERS	Analyte: <i>Cadmium</i>	Activity Code:	
03AM02	WSS LEAD VICINITY								
SAMPLERS: (Print Name and Sign)									
MICHAEL MIKUMA MATHA CARINO									
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION		TAG NUMBERS		
S20	8/6	1230	✓		4726 MCKEE (X6C)		1	✓	85247 SHIPPED OUT
S21	8/7	1025	✓		RA X76		1	✓	85247 SHIPPED OUT
S22	8/6	1600	✓		AESCO X73		1	✓	85247 SHIPPED OUT
S23	8/7	1025	✓		RA X79		1	✓	85248 SHIPPED OUT
S24	8/7	1215	✓		RA X77		1	✓	85248 SAMPLE STORED AT CRC
S25	8/7	1430	✓		4926 GIASIELLI (X80)		1	✓	85248 PDR RCRA INSTRUCTIONS 8/28/03
Relinquished by: (Signature) <i>Mike Mikuma</i>			Date / Time 8/6/03 1715		Received by: (Signature) <i>William Sy</i>		Ship To: LABORATORY FOR ENVIRONMENTAL AND GEOLOGIC STUDIES 8/7/03 17:15		
Relinquished by: (Signature) <i>William Sy</i>			Date / Time 8/28/03 14:22		Received by: (Signature) <i>Amie Motisinger</i>		ATTN: Airbill Number 8/28/03 14:22		
Relinquished by: (Signature)			Date / Time		Received for Laboratory by: (Signature)		Date / Time		Chain of Custody Seal Numbers 85247, 85248
Distribution: White - Accompanies Shipment; Pink - Coordinator Field Files; Yellow - Laboratory File									



CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME <i>03AM02 WIS CONS VICINITY</i>					NO. OF CONTAINERS						Activity Code: <input type="text"/>	
SAMPLERS:	(Print Name and Sign) <i>John Miller Milton Lao, NO</i>						<i>ANALYST: L. M. Lao</i>						
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION						TAG NUMBERS		
516	8/5	0930	<input checked="" type="checkbox"/>		4807 McCook (X49)	1	<input checked="" type="checkbox"/>						SHIPPED OUT
517	8/5	1040	<input checked="" type="checkbox"/>		4830 McCook (X50)	1	<input checked="" type="checkbox"/>						SHIPPED OUT
✓ 518	8/5	1235	<input checked="" type="checkbox"/>		Fm 12 (X51)	1	<input checked="" type="checkbox"/>						SAMPLES STORED AT CRL FOR
✓ 519	8/5	1335	<input checked="" type="checkbox"/>		Fm 12 (X56)	1	<input checked="" type="checkbox"/>						RQCA INSTRUCTIONS 8/28/03 to
Relinquished by: (Signature) <i>John Miller</i>			Date / Time 8/5/03 12:15		Received by: (Signature) <i>William Snyder</i>		8/5/03 17:20	Ship To: LAB FOR ENVIRONMENT & GEOSCIENCE STUDIES					
Relinquished by: (Signature) <i>William Snyder</i>			Date / Time 8/28/03 14:22		Received by: (Signature) <i>Anne Moisinger</i>		8/28/03 14:22	ATTN:					
Relinquished by: (Signature)			Date / Time		Received for Laboratory by: (Signature)		Date / Time	Airbill Number					
											Chain of Custody Seal Numbers <i>10806</i>		

Distribution: White - Accompanies Shipment; Pink - Coordinator Field Files; Yellow - Laboratory File



CHAIN OF CUSTODY RECORD

PROJ. NO. 03RM02	PROJECT NAME USS LEAD VICINITY					NO. OF CONTAINERS	Analyte: CHP4						Activity Code:		
SAMPLERS: (Print Name and Sign) M. M. [Signature] M. M. [Signature]															
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION										
S13	7/31/03	1025	X		S13 VACANT LT - GRAS (X41)		1	✓							TAG NUMBERS SAMPLE STORED AT CORE PON REKA INSTRUCTIONS 8/28/03 AND SHIPPED OUT
S14	7/31	1110	X		4907 GRASSALI (X42)		1	✓							SHIPPED OUT
S15	7/31	1145	X		4904 GRASSALI (X43)		1	✓							SHIPPED OUT
Relinquished by: (Signature) <i>M. M. [Signature]</i>			Date / Time 7/31/03 1025		Received by: (Signature) <i>William Sargeant</i>		17/31/03 17:15		Ship To: LAB FOR ENVIRONMENT & GEOLOGIC STUDIES						
Relinquished by: (Signature) <i>William Sargeant</i>			Date / Time 8/28/03 14:23		Received by: (Signature) <i>Annie Mokinske</i>		8/28/03 14:23		ATTN:						
Relinquished by: (Signature) <i>William Sargeant</i>			Date / Time		Received for Laboratory by: (Signature)		Date / Time		Airbill Number						
									Chain of Custody Seal Numbers <i>10803</i>						

Distribution: White - Accompanies Shipment; Pink - Coordinator Field Files; Yellow - Laboratory File



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5-43650

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME <i>03am02 USS WAO VICINITY</i>				NO. OF CONTAINERS	Analyte: <i>LEAD</i>	TAG NUMBERS <i>SAMPLES STORED AT CCR FOR RECALL INSTRUCTIONS SHIPPED OUT 8/28/03 SHIPPED OUT ↓</i>	Activity Code:
SAMPLERS: (Print Name and Sign) <i>Michael Michael Mike SICKLES</i>								
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION			
S10	7/30	0930	✓		4842 Keweenaw (X31)		1	✓
S11	7/30	0950	✓		4826 Keweenaw (X32)		1	✓
S12	7/30	(30)	✓		4719 McCook (X36)		1	✓
Relinquished by: (Signature) <i>William J. Motsinger</i>			Date / Time 7/30/03 17:04	Received by: (Signature) <i>William J. Motsinger</i>		7/30/2003 17:05	Ship To: LAB FOR ENVIRONMENT 1 GEOLOGIC SURVEY	
Relinquished by: (Signature) <i>William J. Motsinger</i>			Date / Time 8/28/03 14:23	Received by: (Signature) <i>Willie Motsinger</i>		8/28/03 14:23	ATTN:	
Relinquished by: (Signature)			Date / Time	Received for Laboratory by: (Signature)		Date / Time	Airbill Number	
Distribution: White - Accompanies Shipment; Pink - Coordinator Field Files; Yellow - Laboratory File								
Chain of Custody Seal Numbers <i>10895</i>								



CHAIN OF CUSTODY RECORD

Distribution: White - Accompanies Shipment; Pink - Coordinator Field Files; Yellow - Laboratory File



CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME						NO. OF CONTAINERS	Activity Code:			
03Am02	USS LEAD VICINITY							Analyte: <i>Cd</i>			
SAMPLERS: (Print Name and Sign) <i>John M. Miller</i> <i>Theresa M. Madsen</i>											
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION			TAG NUMBERS			
✓ S04	7/24/03	1036	X		XH - KENNEDY GANS Bl.			1	✓	SHIPPED OUT	
✓ S05	7/24/03	1445	X		X07 - FMR AR (MAP #1)			1	✓	SAMPLE STORED AT GRC FOR REA INSTRUMENTS 8/28/03	
✓ S06	7/24/03	1515	X		S06 C 151ST CT - X19			1	✓	SHIPPED OUT	
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		7/24/03		Ship To:			
<i>John M. Miller</i>		7/24/03 17:11		<i>William Snyder</i>		17:11		LABORATORY FOR ENV. & GEOL. STUDIES			
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		8/28/03		ATTN:			
<i>William Snyder</i>		8/28/03 14:24		<i>Anne Motsinger</i>		14:24					
Relinquished by: (Signature)		Date / Time		Received for Laboratory by: (Signature)		Date / Time		Airbill Number			
Chain of Custody Seal Numbers <i>12308</i>											

Distribution: White - Accompanies Shipment; Pink - Coordinator Field Files; Yellow - Laboratory File



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5-43631

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME <i>KISS LENO VICINITY</i>					NO. OF CONTAINERS	Analyte: <i>CMPX</i>						Activity Code:				
SAMPLERS: (Print Name and Sign) <i>M CAPINO</i> <i>M MIRVAT</i>																	
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION												
✓ S01	7/28/03	10:30	X		S10-812 E 15TH ST					1	✓						SAMPLE STORED AT CRL PDR
✓ S02	7/28/03	12:30	X		804 E 15TH ST 2					1	✓						RCRA INSTRUCTION 8/28/03 recd
S03	7/28/03	13:30	X		5040 KENNEDY					1	✓						SHIPPED OUT
D03	7/28/03	13:30	X		Dup of S03					1	✓						SHIPPED OUT
TAG NUMBERS																	
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Ship To:											
<i>M Mirvat</i>		7/23/03 5:15pm		<i>William Hayes</i>		LABORATORY FOR ENV & GEOL STUDIES											
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		ATTN:											
<i>William Hayes</i>		8/28/03 14:24		<i>Anne Matsinger</i>		8/28/03 14:24											
Relinquished by: (Signature)		Date / Time		Received for Laboratory by: (Signature)		Date / Time		Airbill Number									
Chain of Custody Seal Numbers <i>12301</i>																	

Distribution: White - Accompanies Shipment; Pink - Coordinator Field Files; Yellow - Laboratory File



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5-43629

APPENDIX D
SRM 2711 CERTIFIED RESULTS

APPENDIX E
DETAILED XRF RESULTS

Table E-1 XRF Data July 23-24, 2003

Table E-2 XRF Data July 29-August 5, 2003

Table E-3 XRF Data August 6-10, 2003

Table E-4 Property Database (Confidential)

APPENDIX E, TABLE E-1

XRF Data July 23-24, 2003

Site: USS Lead Vicinity

Serial #XL700-U2167NR4212

No	XLNo	Site	Insp	Sample	Notes	Ssec	Date/Time	Bulk		Sample Results in ppm								
								Fe (ppm)	Fe Error	Pb (ppm)	Pb Error	Zn (ppm)	Zn Error	Zr (ppm)	Zr Error	Rb (ppm)	Rb Error	Mo (ppm)
13	13	Cal	MJM	Shutter Ca		19.7	7/23/2003 10:26	NA		NA		NA		NA		NA		NA
14	14	Cal	MJM	Shutter Ca		19.6	7/23/2003 10:36	NA		NA		NA		NA		NA		NA
15	15	NV	MJM	Low time		3.6	7/23/2003 10:44			<LOD	690	<LOD	3300	<LOD	165	<LOD	270	3080
16	16	NV	MJM	Low time		23.2	7/23/2003 10:44			<LOD	9.45	19.4	12.1	<LOD	2.7	<LOD	5.85	<LOD
17	17	SRM-NV	MJM	Invalid test		46.8	7/23/2003 10:54	9036.8	380	411.6	30.5	149.1	38.1	75	6.7	70.5	12	<LOD
18	18	NV	MJM	Invalid test		33.6	7/23/2003 10:59	8499.2	65.1	3337.6	14	4848	21.2	724	3	1640	7.7	985.6
19	19	NV	MJM	Invalid test		49.6	7/23/2003 11:01	4547.2	340	54.3	18.1	<LOD	86.85	<LOD	6.45	<LOD	12.75	<LOD
20	20	NV	MJM	Invalid test		0	7/23/2003 11:03	17497.6	110	2969.6	17	2899.2	23.6	390.6	3.1	1540	10.1	952.8
21	21	NV	MJM	Invalid test		65.5	7/23/2003 11:03	3059.2	300	58.4	17.7	<LOD	133.5	<LOD	5.55	<LOD	11.25	<LOD
22	22	NV	MJM	Invalid test		71.6	7/23/2003 11:05	8339.2	43.6	3240	9.4	4678.4	14.2	708.8	2	1429.6	4.8	1029.6
23	23	X01	MJM	S01 810/812 E. 151st		70.8	7/23/2003 11:14	28185.6	660	744	38.1	1169.6	60.2	51.7	6.4	55.7	11.9	<LOD
24	24	Bag Blank	MJM	OK		30.8	7/23/2003 11:32	<LOD	57.75	<LOD	8.1	30.8	11	<LOD	2.4	<LOD	4.95	<LOD
25	25	NV	MJM	Invalid SRM		60.4	7/23/2003 11:40	30387.2	770	573.6	37.5	1140	66.2	54.8	7.1	73.7	14	<LOD
26	26	NV	MJM	Invalid SRM		70.3	7/23/2003 11:43	9715.2	310	458.4	25.5	137.1	22	83.9	5.5	59	9.1	<LOD
27	27	NV	MJM	Invalid SRM		36.9	7/23/2003 11:52	9356.8	440	398.6	34.1	95.8	62.8	72.6	7.5	61	13.1	<LOD
28	28	NV	MJM	Invalid SRM		63.8	7/23/2003 11:54	16499.2	500	845.6	41.5	271.4	34	169.4	9.1	128.1	15.1	<LOD
29	29	SRM	MJM	Pb, Zn, Fe low		61.1	7/23/2003 11:58	20492.8	570	1040	47.2	298.6	36.6	200.9	10.2	156.9	16.9	<LOD
30	30	Cal	MJM	Shutter Ca		19.7	7/23/2003 12:37	NA		NA		NA		NA		NA		NA
31	31	X02	MC	S02 806 151st St		71	7/23/2003 12:46	9446.4	340	609.2	32.6	557.2	40.5	60.6	5.6	48.3	9.9	<LOD
32	32	X03	MJM	S03, D03 5040 Kennedy		62.8	7/23/2003 13:56	16691.2	430	1389.6	46.4	1069.6	52.2	98.4	6.4	43.4	9.5	<LOD
33	33	Bag blank	MJM	OK		50.5	7/23/2003 14:25	<LOD	46.5	<LOD	6.9	18.5	8	<LOD	1.8	<LOD	4.05	5.3
34	34	X04	MC	Not sampled		61.4	7/23/2003 14:45	13990.4	400	914.4	38.5	734	44.8	71.7	5.8	60.5	10.3	<LOD
35	35	X05	MC	Not sampled		60.6	7/23/2003 14:52	9324.8	330	527.2	30	525.2	38.8	50	5.2	54.3	9.9	<LOD
36	36	X06	MC			61.7	7/23/2003 15:18	7705.6	300	96.1	15.2	56.2	19	100.8	6.3	67.8	10.2	<LOD
37	37	X07	MC	S26 714 E. 151st St; resampled 8/12 MC		60.8	7/23/2003 15:38	12896	380	924.8	38.5	638	41.7	105.7	6.5	78.8	10.9	<LOD
38	38	P-X07-2	MJM	Pb Avg. = 869; Precision test		31.1	7/23/2003 15:43	12697.6	520	916.8	52.7	599.6	56.2	98.6	8.7	66.1	14.2	<LOD
39	39	P-X07-3	MJM	Precision test		31.5	7/23/2003 15:46	12294.4	560	822.4	54.2	622.4	61.5	93.4	9.3	71.8	15.8	<LOD
40	40	P-X07-4	MJM	Precision test		31.5	7/23/2003 15:49	12800	510	904.8	51.3	659.6	57.1	96.3	8.5	76.6	14.5	<LOD
41	41	P-X07-5	MJM	Precision test		30.5	7/23/2003 15:51	14092.8	610	863.2	56.5	532.8	59.8	88.4	9.2	62.7	15.4	<LOD
42	42	P-X07-6	MJM	Precision test		31.3	7/23/2003 15:54	12396.8	550	822.4	53.2	685.6	62.7	94.6	9.1	69	15.3	<LOD
43	43	P-X07-7	MJM	Precision test		31.6	7/23/2003 15:56	12198.4	560	817.2	54.8	605.2	61.7	99.8	9.6	76.7	16.3	<LOD
44	44	X08	MC	S27 5028 Alex'der; resampled 8/12 MC		31.1	7/23/2003 16:00	10598.4	550	596.8	49.8	588.8	64.3	71.2	9	55.8	15.7	<LOD
45	45	Calibration	MJM	Shutter Ca		19.7	7/24/2003 9:09	NA		NA		NA		NA		NA		NA
46	46	Bag blank	MJM	OK		60.6	7/24/2003 9:19	<LOD	56.85	<LOD	6.15	15.9	7.6	<LOD	1.8	<LOD	3.75	4
47	47	NV	MJM	Invalid test		0.8	7/24/2003 9:24	19596.8	4800	916	380	<LOD	375	171.1	81	272.4	180	<LOD
48	48	SRM	MJM			71	7/24/2003 9:25	21388.8	540	1089.6	44.5	303.4	34	214.4	9.6	157.4	15.6	<LOD
49	49	X09	MES	No sample		60.2	7/24/2003 10:07	13196.8	380	632.8	31.4	708.4	42.4	77.4	5.8	49	9.3	<LOD
50	50	X10	MES	No sample		60.6	7/24/2003 10:38	13491.2	370	746.8	32.6	738.4	41.7	70.5	5.4	61.2	9.6	<LOD
51	51	X11		S04 Kennedy Gdns S		60.6	7/24/2003 11:22	14988.8	400	1060	39.1	887.2	46.1	84.1	5.7	43.2	8.7	<LOD
52	52	Bag Blank	MJM	OK		40.8	7/24/2003 11:35	<LOD	62.55	<LOD	7.5	20.1	9.8	<LOD	2.1	<LOD	4.8	4.7
53	53	X12		Pb Avg. = 883; Kennedy Gdns		62.1	7/24/2003 11:55	22400	570	860	40.5	790.4	50.1	84.9	6.7	36.2		

71	71	Bag blank	MJM			60.4	7/24/2003 15:58	<LOD	48.3	<LOD	6.6	22.3	8.2	<LOD	1.8	<LOD	3.9	
72	72	X20	MES	S29		61.8	7/24/2003 16:04	14092.8	470	627.2	37.5	825.6	54.9	57.5	6.4	60.3	12.1	~
73	73	NV	MJM		Low time	21.9	7/24/2003 16:16	8864	53.9	3089.6	10.7	5318.4	17.7	686.4	2.3	1629.6	6.1	954.
74	74	SRM	MJM			60.8	7/24/2003 16:17	21196.8	590	1069.6	47.9	307.8	37.3	214	10.5	173.8	17.6	<LOD

Notes to Data Table:

- 1 XL number means reading number on the Niton XRF
- 2 Site is the XRF location or the bag blank or the SRM or the self-calibration
- 3 Insp means the person collecting the sample at the XRF location, or the operator of the XRF, as applicable
- 4 SRM means Standard Reference Material 2711
- 5 MJM is Mike Mikulka; MC is Mirtha capiro; MES is Mike Sickles

APPENDIX E, TABLE E-1

XRF Data July 23-24, 2003

Site: USS Lead Vicinity

Serial #XL700-U2167NR4212

Bulk Sample Results in ppm

No	Sr (ppm)	Sr Error	Se (ppm)	Se Error	As (ppm)	As Error	No	Hg (ppm)	Hg Error	Cu (ppm)	Cu Error	Ni (ppm)	Ni Error	Co (ppm)	Co Error	Mn (ppm)	Mn Error	Cr (ppm)	Cr Error	Cycle	RES7
13	NA		NA		NA		13	NA		NA		1 of 1	373.4								
14	NA		NA		NA		14	NA		NA		1 of 1	NA								
15	392.4	210	<LOD	330	<LOD	720	15	<LOD	645	<LOD	8097.6	122982.4	32000	<LOD	61478.4	198963.2	83968	1379532.8	329932.8	1 of 1	NA
16	<LOD	5.85	<LOD	5.85	<LOD	8.25	16	<LOD	5.7	<LOD	28.8	<LOD	48	<LOD	58.35	<LOD	78.45	<LOD	85.65	1 of 1	NA
17	<LOD	13.65	<LOD	9.9	59.2	24.5	17	<LOD	13.65	154.5	80.7	4297.6	190	<LOD	360	<LOD	450	680	230	1 of 1	NA
18	987.2	4.2	684	4.9	144.7	10.6	18	1589.6	7.8	2369.6	25.2	6048	37	8147.2	62.3	14988.8	110	18099.2	120	1 of 1	NA
19	<LOD	11.1	<LOD	10.8	<LOD	21.9	19	<LOD	10.8	467.6	150	12000	390	<LOD	435	<LOD	465	1699.2	320	1 of 1	NA
20	863.2	5.3	<LOD	4.35	1729.6	15.4	20	<LOD	7.65	3868.8	36.5	5478.4	49.1	2529.6	72.7	9120	140	21388.8	170	1 of 1	NA
21	<LOD	10.05	<LOD	11.1	<LOD	20.85	21	<LOD	10.65	380.6	240	42982.4	840	<LOD	600	<LOD	420	1129.6	300	1 of 1	NA
22	775.2	2.6	924.8	3.6	<LOD	10.05	22	1329.6	4.8	2320	16.8	5398.4	24.1	7737.6	41.5	12896	69.7	17792	81.4	1 of 1	NA
23	124.1	13	<LOD	10.35	<LOD	42.75	23	<LOD	16.2	<LOD	86.7	<LOD	133.05	<LOD	495	<LOD	675	<LOD	375	1 of 1	NA
24	<LOD	4.95	<LOD	5.1	<LOD	7.05	24	<LOD	4.65	<LOD	23.85	<LOD	42	<LOD	48.45	<LOD	73.35	<LOD	76.8	1 of 1	NA
25	101	13.8	<LOD	11.55	<LOD	43.65	25	<LOD	16.65	<LOD	96	<LOD	150	<LOD	570	<LOD	780	<LOD	420	1 of 1	NA
26	<LOD	11.1	<LOD	7.95	36.5	20	26	<LOD	11.25	71.7	31.7	<LOD	86.25	270.6	170	462.8	250	258.8	160	1 of 1	NA
27	<LOD	15.45	<LOD	11.25	49.1	27.2	27	<LOD	14.55	<LOD	240	17190.4	450	<LOD	510	<LOD	540	528.8	270	1 of 1	NA
28	57.9	11.9	<LOD	11.55	99.7	32.5	28	<LOD	17.25	<LOD	64.35	<LOD	118.65	510.8	270	<LOD	555	<LOD	330	1 of 1	NA
29	92.8	13.1	<LOD	12.15	75.1	35.9	29	<LOD	17.7	<LOD	69.15	<LOD	128.4	<LOD	450	636	420	<LOD	360	1 of 1	NA
30	NA		NA		NA		30	NA		NA		1 of 1	376.2								
31	<LOD	12.9	<LOD	9.6	<LOD	37.35	31	<LOD	13.95	<LOD	64.35	<LOD	93.9	309.2	190	<LOD	405	<LOD	240	1 of 1	NA
32	<LOD	13.95	<LOD	10.2	<LOD	51.45	32	<LOD	16.8	140.2	51.8	<LOD	105.45	420	230	782	330	<LOD	285	1 of 1	NA
33	<LOD	3.9	<LOD	4.05	<LOD	5.7	33	<LOD	3.9	20.9	12.7	<LOD	33.15	<LOD	39.45	<LOD	56.25	<LOD	63.6	1 of 1	NA
34	<LOD	13.2	<LOD	9.6	44.4	29.2	34	<LOD	15.45	107.7	46.9	<LOD	100.65	<LOD	330	703.2	310	<LOD	285	1 of 1	NA
35	<LOD	12.3	<LOD	9	<LOD	34.35	35	<LOD	13.2	<LOD	62.1	<LOD	93.75	<LOD	285	<LOD	390	<LOD	240	1 of 1	NA
36	<LOD	10.8	<LOD	7.5	<LOD	17.7	36	<LOD	8.85	<LOD	45	<LOD	85.8	<LOD	255	<LOD	345	<LOD	225	1 of 1	NA
37	<LOD	11.85	<LOD	9.6	<LOD	42.9	37	<LOD	15.15	84.2	43.9	<LOD	95.55	<LOD	300	521.2	290	<LOD	255	1 of 1	NA
38	<LOD	16.2	<LOD	12.9	<LOD	58.95	38	<LOD	20.7	103.5	61	<LOD	133.8	<LOD	420	<LOD	600	<LOD	345	1 of 1	NA
39	<LOD	17.55	<LOD	13.65	<LOD	61.8	39	<LOD	21.75	<LOD	97.5	<LOD	143.1	553.6	320	663.2	440	<LOD	405	1 of 1	NA
40	<LOD	16.05	<LOD	13.2	<LOD	57.75	40	<LOD	19.95	<LOD	90.75	<LOD	135.45	<LOD	420	825.6	400	<LOD	345	1 of 1	NA
41	<LOD	17.25	<LOD	14.7	<LOD	63	41	<LOD	21.6	<LOD	106.8	434.4	120	<LOD	495	<LOD	720	1169.6	360	1 of 1	NA
42	<LOD	17.25	<LOD	14.55	<LOD	60.15	42	<LOD	20.55	<LOD	96.45	<LOD	143.1	<LOD	450	1049.6	450	<LOD	420	1 of 1	NA
43	<LOD	17.7	<LOD	15.3	<LOD	61.65	43	<LOD	20.1	<LOD	100.35	<LOD	150	<LOD	465	<LOD	660	<LOD	405	1 of 1	NA
44	<LOD	18.6	<LOD	14.4	<LOD	56.1	44	<LOD	20.85	<LOD	103.8	<LOD	150	<LOD	450	<LOD	630	<LOD	390	1 of 1	NA
45	NA		NA		NA		45	NA		NA		1 of 1	371.6								
46	<LOD	3.75	<LOD	3.45	<LOD	5.25	46	<LOD	3.6	26	12.6	<LOD	33	<LOD	43.95	<LOD	65.85	<LOD	72.9	1 of 1	NA
47	<LOD	150	<LOD	94.05	<LOD	480	47	<LOD	195	<LOD	540	<LOD	1080	<LOD	3900	<LOD	5246.4	<LOD	2548.8	1 of 1	NA
48	106.7	12.3	<LOD	11.4	93.4	34	48	<LOD	17.4	<LOD	65.25	<LOD	123.3	557.2	280	<LOD	585	<LOD	330	1 of 1	NA
49	<LOD	12.6	<LOD	9	39.4	24.2	49	<LOD	12.45	<LOD	63.6	<LOD	95.85	<LOD	315	<LOD	420	<LOD	255	1 of 1	NA
50	<LOD	12.3	<LOD	8.55	<LOD	37.2	50	<LOD													

71	<LOD	3.75	<LOD	3.9	<LOD	5.4	71	<LOD	3.75	25.9	12.9	<LOD	32.4	<LOD	41.25	<LOD	59.55	<LOD	64.8	1 of 1	NA
72	<LOD	15.3	<LOD	10.8	<LOD	42.6	72	<LOD	15.9	94.3	56.3	<LOD	117.45	<LOD	375	776.4	370	<LOD	330	1 of 1	NA
73	660.8	2.9	478.8	3.5	650.4	8.6	73	1389.6	6	1440	19.2	6438.4	30.3	9638.4	53.7	13798.4	86.1	21388.8	100	1 of 1	NA
74	92.9	13.1	<LOD	11.7	69.9	36.3	74	<LOD	18.9	75.2	47.5	<LOD	130.35	475.6	310	967.2	430	<LOD	360	1 of 1	NA

Notes to Data Table:

- 1 XL number means reading number on the Niton XRF
- 2 Site is the XRF location or the bag blank or the SRM or the self-calibration
- 3 Insp means the person collecting the sample at the XRF location, or the operator of the XRF, as applicable
- 4 SRM means Standard Reference Material 2711
- 5 MJM is Mike Mikulka; MC is Mirtha capiro; MES is Mike Sickles

APPENDIX E, TABLE E-2

Header: XRF Data July 29 to August 5, 2003

Site: USS Lead Vicinity

No	XLNo	Site	Insp	Sample	Note	Bulk			Sample Results in ppm												
						Ssec	Date/Time	Fe	Fe Error	Pb	Pb Error	Zn	Zn Error	Zr	Zr Error	Rb	Rb Error	Mo	Mo Error		
1	1	Cal	MJM	Self-Cal		19.7	#####	NA		NA		NA		NA		NA		NA			
2	2	Bag Blank	MJM	Ni, Fe and Cr out		61.4	#####	513.2	69.7 <LOD	7.2 <LOD	24 <LOD	1.95 <LOD	4.2	7.8	2.2						
3	3	Bag Blank2	MJM	OK		60.2	#####	<LOD	41.55 <LOD	7.05	23	8 <LOD	1.8 <LOD	3.9	7.2	2					
4	4	SRM	MJM	Not Valid		60.6	#####	7846.4	21	3497.6	4.6	4537.6	6.6	665.6	0.9	1480	2.3	987.2	1		
5	5	SRM	MJM	Pb OK		60.7	#####	21883	590	1109.6	48.5	302	37.1	219.8	10.6	154.9	16.8 <LOD	8.85			
6	6	X21	MJM			60.8	#####	7584	290	104.7	15.6	163.9	24.4	72.8	5.7	44.7	9.1 <LOD	6.3			
7	7	X22	MC			65.2	#####	11398.4	370	378.6	25.9	680.4	43.5	60.7	5.5	57.2	10.1 <LOD	6.3			
8	8	Bag Blank	MJM	OK		104.6	#####	<LOD	41.85 <LOD	5.1	21.5	6 <LOD	1.35 <LOD	2.85	7.1	1.5					
9	9	X24	MES S07, M07	D07 (EMPA); 4929 Melville		90.9	#####	17190.4	390	827.2	31.2	1009.6	43.8	90.2	5.3	49.6	8.2 <LOD	5.4			
10	10	X25	MES	Pb Average = 364		77	#####	9606.4	340	378.4	26.1	441.6	36.7	59.1	5.5	48.7	9.7 <LOD	6.45			
11	11	P-X25-2	MJM	Precision test		65.5	#####	8556.8	340	339.8	26.8	425.2	39	64	6	35.2	9.6 <LOD	7.05			
12	12	P-X25-3	MJM	Precision test		60.9	#####	8864	320	383.6	26.1	462.4	36.9	62.6	5.6	51.8	9.8 <LOD	6.15			
13	13	P-X25-4	MJM	Precision test		70.7	#####	8076.8	330	347	26.7	424.4	38	48.3	5.5	48.6	10.2	7.5	4.6		
14	14	P-X25-5	MJM	Precision test		61.6	#####	10099.2	370	367.2	27.4	502.8	40.9	58.4	5.8	54.2	10.6	7.3	4.6		
15	15	P-X25-6	MJM	Precision test		62.3	#####	10195.2	390	325.8	27.3	446	40.9	53.7	6	56.1	11.2 <LOD	7.35			
16	16	P-X26-7	MJM	Precision test		61.2	#####	10297.6	360	406.2	27.1	534.4	39.7	60.7	5.6	51.3	9.9 <LOD	6.45			
17	17	X23	MC			60.8	#####	16499.2	460	371.8	26.2	734.8	46.6	122.1	7.1	48.2	9.7 <LOD	6.9			
18	18	Bag Blank	MJM	OK		60.6	#####	<LOD	47.1 <LOD	6.6	12.8	7.7 <LOD	1.8 <LOD	3.75	6.8	2					
19	19	X26	MES S08	4912 Melville		61	#####	20096	550	962.4	44.3	1220	63.4	89.5	7.1	44.9	10.9 <LOD	7.35			
20	20	X27	MES			70.5	#####	8115.2	300	188.5	19	280.6	29.8	51.2	5.2	64.1	10.1 <LOD	6			
21	21	X28	MC S09	4912 Alexander		72.6	#####	16089.6	420	608.4	30.3	907.2	47.2	75	5.7	50.6	9.5 <LOD	6			
22	22	Void	MJM	Invalid reading		0	#####	3459.2	74.4	2668.8	16.1	6227.2	31.9	499.6	3.3	1460	9.7	906.4	4.2		
23	23	X29	MES	questionable; redo		64	#####	11795.2	26	3577.6	5.2	3619.2	6.8	663.2	1	1689.6	2.8	1020	1.2		
24	24	Bag Blank	MJM	equip. cleaned; OK		60.1	#####	<LOD	57 <LOD	7.05	14.7	7.9 <LOD	1.95 <LOD	4.05	6.2	2.1					
25	25	SRM	MJM	Pb, Zn OK		60.8	#####	21094.4	580	1089.6	48.6	328.6	37.9	216.6	10.6	167.6	17.4 <LOD	9.15			
26	26	X29	MJM	Pb average = 429		78.6	#####	11200	330	435.2	24.7	708	39.8	80.4	5.4	46.7	8.5 <LOD	5.7			
27	27	X29 dup	MJM	Disregard R23 for X29		60.6	#####	11596.8	380	423.2	28	759.6	46.8	74.5	6.1	44.3	9.7 <LOD	6.75			
28	28	Cal	MJM	Self-Cal		19.7	7/30/2003 8:52	NA		NA		NA		NA		NA					
29	29	Bag Blank	MJM	OK		64.4	7/30/2003 8:54	<LOD	41.55 <LOD	6.3	19.6	7.5 <LOD	1.65 <LOD	3.45	5.2	1.8					
30	30	SRM	MJM	Pb OK		61.4	7/30/2003 8:58	21888	590	1069.6	47.3	270.4	35.4	198.8	10	151.6	16.5 <LOD	8.7			
31	31	Re-Cal	MJM	Changed Battery		19.7	7/30/2003 9:53	NA		NA		NA		NA		NA					
32	32	Bag Blank	MJM	NV, term early		10.2	7/30/2003 9:54	259.6	130 <LOD	18.45	34.6	22 <LOD	4.65 <LOD	10.2 <LOD							
33	33	Bag Blank	MJM	Fe, Cr high		53.5	7/30/2003 9:55	376	62.6 <LOD	7.5	18.7	8.9 <LOD	1.95 <LOD	4.2	5.8	2.2					
34	34	Bag Blank	MJM	Still high after cleaning		46.5	#####	403.6	71.3 <LOD	8.4 <LOD	13.35 <LOD	2.25 <LOD	4.95	6.3	2.5						
35	35	Bag Blank	MJM	Cleaned board; OK		46.1	#####	<LOD	72.45 <LOD	7.5	19.6	9.6 <LOD	2.1 <LOD	4.65	7.5	2.4					
36	36	X30	MJM	MLK Park		62	#####	6764.8	270	80.7	13.9	131.6	22.2	145.4	7	48.1	8.8 <LOD	6.6			
37	37	X31	MES S10	4842 Kennedy		94.8	#####	16294.4	380	578.4	26.4	806.8	39.9	81.7	5.2	52.1	8.4 <LOD	5.55			
38	38	X32	MES S11	4826 Kennedy		63	#####	19289.6	500	626.4	33.3	1029.6	54	115.1	7	42.6	9.6 <LOD	6.9			
39	39	Bag Blank	MJM	Invalid test; 4 sec		4.4	#####	382	220 <LOD	28.2 <LOD	53.55 <LOD	6 <LOD					15.45 <LOD	11.85			
40	40	Bag Blank	MJM	OK		30.4	#####	252.2	75.6 <LOD	10.5	23	12 <LOD	2.7 <LOD	5.55	5.3	2.9					
41	41	X33	MES	No sample; X31, X32		86.7	#####	17088	400	562	27.2	762.4	40.2	107.1	5.8	49.6	8.5 <LOD	5.85			
42	42	Bag Blank	MJM	Fe, Cr high		48.7	#####	334.8	66.8 <LO												

56	56	Bag Blank	MJM	OK	30.5	#####	<LOD	83.85	<LOD	9.15	19.9	11.4	<LOD	2.55	<LOD	5.7	7.1	2.9
57	57	Unknown	MJM	Appears to be dup of R56	30.5	#####	<LOD	83.85	<LOD	9.15	19.9	11.4	<LOD	2.55	<LOD	5.7	7.1	2.9
58	58	Unknown	MJM	Appears to be dup of R56	30.5	#####	<LOD	83.85	<LOD	9.15	19.9	11.4	<LOD	2.55	<LOD	5.7	7.1	2.9
59	59	X37	MJM		75.6	#####	21888	540	380	26.5	867.2	50.8	118.1	7.1	42.9	9.6	<LOD	7.2
60	60	X38	MES		61.7	#####	9075.2	330	223.2	21.4	357.6	34.5	153	7.9	41.4	9.5	<LOD	7.2
61	61	SRM	MJM		62.3	#####	22694.4	600	1129.6	48.8	310.6	37.4	218.4	10.5	170.6	17.4	<LOD	8.85
62	62	X39	MES		72.7	#####	13299.2	370	320.6	22.6	687.6	41.4	64.8	5.2	51.2	9.1	<LOD	6
63	63	Cal	MJM	Self-Cal	19.7	#####	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
64	64	Cal	MJM	Self-Cal	19.7	7/31/2003 9:02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
65	65	Bag Blank	MJM	OK	35.1	#####	<LOD	67.05	<LOD	9.6	18.6	10.7	<LOD	2.4	<LOD	4.8	6.2	2.7
66	66	SRM	MJM	Pb OK	92	#####	21696	470	1120	39.3	301.4	29.9	213	8.4	156.8	13.6	<LOD	6.9
67	67	X40	MC		67.5	#####	11296	340	399.6	24.6	358.2	31.3	115.6	6.3	61.8	9.4	<LOD	6.15
68	68	X41	MJM	Vac.Lot @ Grasselli & 150	62.1	#####	85094.4	1600	1240	57.7	1509.6	84	216.8	11.4	28.9	11.8	<LOD	10.05
69	69	Bag Blank	MJM	OK; Cr, Fe < 3SD	35.1	#####	97.6	64.4	<LOD	9.3	22.8	11.3	<LOD	2.4	<LOD	6	7	2.8
70	70	X41	MJM S13	Sieved	93	#####	90470.4	1500	1220	49.4	1469.6	70.6	163.8	8.7	29.5	10.3	<LOD	8.55
71	71	No Test	MJM		3.6	#####	<LOD	315	<LOD	31.8	<LOD	60.9	<LOD	7.35	<LOD	22.5	<LOD	12.9
72	72	Bag Blank	MJM	OK; Cr < 3SD	52.9	#####	<LOD	75.75	<LOD	7.8	19.9	9.1	<LOD	1.95	<LOD	4.2	7.1	2.3
73	73	X42	MC S14	4907 Grasselli	86.5	#####	18790.4	420	860.8	33.1	905.6	43.5	171.2	7.1	48.7	8.6	<LOD	6.15
74	74	X43	MJM S15	4904 Grasselli	92.4	#####	20096	420	626	27.4	837.6	40.7	134.5	6.1	48.8	8.1	<LOD	5.7
75	75	Cal	MJM	Self-Cal	19.7	#####	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
76	76	Bag Blank	MJM	High readings; cleaned eq.	138	#####	124.7	33	<LOD	4.65	21	5.6	<LOD	1.2	<LOD	2.55	6	1.4
77	77	Bag Blank	MJM	OK; Cu, Zn, Mo < 3 SD	45.8	#####	<LOD	66.3	<LOD	8.25	22.9	9.7	<LOD	2.1	<LOD	4.65	6.2	2.4
78	78	X44	MC		61.9	#####	10995.2	360	309.6	23.3	644.8	41.5	74.2	5.8	42.2	9.1	<LOD	6.15
79	79	X45	MJM		80.7	#####	16499.2	410	391	23.9	742.8	41.6	123.6	6.4	54.6	9.1	<LOD	6.3
80	80	X46	MC	No sample; Pb Avg = 459	70.2	#####	17088	460	453.2	28	642.8	42.8	160.2	7.7	66.6	10.4	<LOD	7.35
81	81	P-X46-2	MJM	Precision test	84.6	#####	16000	420	456.4	26.8	639.6	40.9	153.3	7.2	61.4	9.7	8.5	4.7
82	82	P-X46-3	MJM	Precision test	64.5	#####	16588.8	450	446.8	27.9	619.6	42.5	165.5	7.9	67.6	10.6	<LOD	7.2
83	83	P-X46-4	MJM	Precision test	60.2	#####	18688	540	486	32.7	658	49.6	155.2	8.7	70.8	12.1	<LOD	8.25
84	84	P-X46-5	MJM	Precision test	66.6	#####	17292.8	470	438	28.1	619.2	43.4	153	7.8	66.5	10.6	<LOD	7.35
85	85	P-X46-6	MJM	Precision test	62.7	#####	17792	500	448	29.8	630.4	45.6	155.7	8.2	63.2	11	<LOD	7.8
86	86	P-X46-7	MJM	Precision test	64.8	#####	18099.2	480	482	29.3	665.2	44.3	156.2	7.8	67.6	10.7	<LOD	7.2
87	87	Bag Blank	MJM	OK	34	#####	<LOD	76.95	<LOD	9.6	16.6	10.6	<LOD	2.4	<LOD	5.4	8.4	2.8
88	88	SRM	MJM	Zn OK; Pb low	64.6	#####	20800	550	1060	45.6	331.6	36.7	221.6	10.1	152.6	16	<LOD	8.4
89	89	X47	MJM		68.3	#####	12896	450	252	25	424.4	40.6	96.9	7.3	53.2	11.2	<LOD	7.95
90	90	Cal	MJM	Self-Cal	19.7	8/5/2003 9:46	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	

APPENDIX E, TABLE E-2

Header: XRF Data July 29 to August 5, 2003

Site: USS Lead Vicinity

No	XLNo	Site	Insp Sample	Note	Bulk		Sample Results in ppm											
					Ssec	Date/Time	Fe	Fe Error	Pb	Pb Error	Zn	Zn Error	Zr	Zr Error	Rb	Rb Error	Mo	Mo Error
91	91	Bag Blank	MJM	OK; Cu, Zn, Mo < 3 SD	60.7	8/5/2003 10:03	<LOD	67.35	<LOD	6.75	15.7	8	<LOD	1.8	<LOD	4.2	4.6	2
92	92	SRM	MJM	Pb, Zn OK	64.1	8/5/2003 10:06	21593.6	570	1089.6	46.6	321.2	36.5	206.2	9.9	158	16.4	<LOD	8.4
93	93	Bag Blank	MJM	OK; Cu, Zn, Mo, Se < 3 SD	118.8	8/5/2003 11:47	<LOD	32.25	<LOD	4.8	13	5.3	<LOD	1.2	<LOD	2.7	3.9	1.4
94	94	X48	MC		68.6	8/5/2003 11:55	12697.6	360	249.8	20.1	525.2	36.1	73.8	5.3	46.4	8.6	<LOD	5.85
95	95	X49	MJM S16	4807 McCook	61.7	8/5/2003 12:05	18188.8	500	587.6	33	559.6	42.2	82.5	6.3	53.4	10.3	<LOD	6.75
96	96	X50	MC S17	4830 McCook; Pb avg. = 736	60.5	8/5/2003 12:15	17792</											

116	116	X57	MJM	Riley Pk outfield	65	8/5/2003 16:17	11596.8	370	144	17.4	204.2	26.9	82.4	5.9	51.7	9.4 <LOD	6.45
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Notes to Data Table:

- 1 XL number means reading number on the Niton XRF
- 2 Site is the XRF location or the bag blank or the SRM or the self-calibration
- 3 Insp means the person collecting the sample at the XRF location, or the operator of the XRF, as applicable
- 4 SRM means Standard Reference Material 2711
- 5 MJM is Mike Mikulka; MC is Mirtha Capiro; MES is Mike Sickles

APPENDIX E, TABLE E-2

Header: XRF Data July 29 to August 5, 2003

Site: USS Lead Vicinity

No	Sr	Sample Results in ppm																RES7	RES7 Error
		Sr Error	Se	Se Error	As	As Error	Hg	Hg Error	Cu	Cu Error	Ni	Ni Error	Co	Co Error	Mn	Mn Error	Cr	Cr Error Cycle	
1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1 of 1	366.2	0
2 <LOD	3.9 <LOD	4.35 <LOD	5.85 <LOD	3.75 <LOD	60.75	3907.2	98.4 <LOD	107.4 <LOD	107.7	442.8	84.7	1 of 1	NA	NA	NA	NA	NA	NA	
3 <LOD	3.75 <LOD	3.9 <LOD	5.7 <LOD	3.6	20.6	12.4 <LOD	31.8 <LOD	38.85 <LOD	55.8 <LOD	63.3	1 of 1	NA	NA	NA	NA	NA	NA	NA	
4 830.4	1.2 691.6	1.5 291.6	3.4 834.4	1.9	2788.8	8.2 4320	10.9 10099.2	21.6 13696	33.9 19098	39.9	1 of 1	NA	NA	NA	NA	NA	NA	NA	
5 122.9	13.6 <LOD	12.3 108	37.3 <LOD	19.35	96.4	48.6 <LOD	132.6 <LOD	465 <LOD	630 <LOD	360	259.2	160	1 of 1	NA	NA	NA	NA	NA	
6 <LOD	11.55 <LOD	7.95 <LOD	18.45 <LOD	9.3 <LOD	47.85 <LOD	84 <LOD	240 <LOD	300 <LOD	435	494	200	1 of 1	NA	NA	NA	NA	NA	NA	
7 <LOD	12.45 <LOD	8.85 <LOD	30.15 <LOD	11.7 <LOD	67.8 <LOD	99.75 <LOD	300 <LOD	420 <LOD	420	<LOD	255	1 of 1	NA	NA	NA	NA	NA	NA	
8 <LOD	2.85 <LOD	2.85 <LOD	4.2 <LOD	2.85	16.6	9.4 <LOD	24.6 <LOD	32.7 <LOD	52.2 <LOD	56.7	1 of 1	NA	NA	NA	NA	NA	NA	NA	
9 <LOD	10.8 <LOD	7.95 <LOD	35.1 <LOD	11.85	84.7	42.7 <LOD	89.25 <LOD	300 <LOD	420 <LOD	420	<LOD	270	1 of 1	NA	NA	NA	NA	NA	
10 <LOD	12.3 <LOD	8.7 <LOD	29.85 <LOD	12	67.9	41.8 <LOD	94.5 <LOD	270 <LOD	405 <LOD	405	<LOD	270	1 of 1	NA	NA	NA	NA	NA	
11 <LOD	12.3 <LOD	9.75 <LOD	31.05 <LOD	12.6	78.3	45.4 <LOD	102.15 <LOD	285 <LOD	420 <LOD	420	<LOD	270	1 of 1	NA	NA	NA	NA	NA	
12 <LOD	12.15 <LOD	8.1 <LOD	29.55 <LOD	11.55	<LOD	58.95 <LOD	91.5 <LOD	270 <LOD	375 <LOD	375	<LOD	240	1 of 1	NA	NA	NA	NA	NA	
13 <LOD	12.6 <LOD	10.05 <LOD	30.75 <LOD	12.3	<LOD	65.1 <LOD	100.65 <LOD	285 <LOD	390 <LOD	390	<LOD	270	1 of 1	NA	NA	NA	NA	NA	
14 <LOD	12.9 <LOD	9.75 <LOD	32.25 <LOD	12.75	<LOD	67.35 <LOD	103.65 355.8	210 <LOD	435	547.2	210	1 of 1	NA	NA	NA	NA	NA	NA	
15 <LOD	13.2 <LOD	9.6 <LOD	32.1 <LOD	12.6	<LOD	68.7 <LOD	109.05 <LOD	315 <LOD	465	504.4	220	1 of 1	NA	NA	NA	NA	NA	NA	
16 <LOD	12.45 <LOD	9 <LOD	30.9 <LOD	12	<LOD	64.2 <LOD	97.8 <LOD	300 505.2	280 <LOD	280	<LOD	285	1 of 1	NA	NA	NA	NA	NA	
17 <LOD	12 <LOD	9.15 <LOD	30.45 <LOD	12.3	188.9	51.2 <LOD	106.8 <LOD	360 584.8	340 <LOD	340	<LOD	300	1 of 1	NA	NA	NA	NA	NA	
18 <LOD	3.75 <LOD	3.9 <LOD	5.4 <LOD	3.75	31.8	13.1 <LOD	33.15 <LOD	39.75 <LOD	61.05 <LOD	64.05	1 of 1	NA	NA	NA	NA	NA	NA	NA	
19 <LOD	15.15 <LOD	11.25 <LOD	50.1 <LOD	17.7	123.2	62.4 <LOD	132 <LOD	435	806.4	410	<LOD	360	1 of 1	NA	NA	NA	NA	NA	
20 <LOD	12.3 <LOD	8.25 <LOD	22.8 <LOD	10.05	79.2	37.6 <LOD	87.3 <LOD	255 <LOD	360 <LOD	360	<LOD	225	1 of 1	NA	NA	NA	NA	NA	
21 <LOD	13.35 <LOD	8.55 <LOD	34.65 <LOD	12.9	119.6	48.2 <LOD	102 <LOD	330 466.4	310 <LOD	310	<LOD	300	1 of 1	NA	NA	NA	NA	NA	
22 706.8	4.9 8.8	3.7 1469.6	14.9 1049.6	9.2	701.6	31.2 6377.6	50.8 12800	96.9 11200	130	19290	160	1 of 1	NA	NA	NA	NA	NA	NA	
23 763.6	1.4 608.4	1.6 292	3.9 944	2.3	2908.8	9.3 5628.8	13.2 6108.8	21.6 11296	37.6 20800	46.1	1 of 1	NA	NA	NA	NA	NA	NA	NA	
24 <LOD	3.9 <LOD	4.05 <LOD	5.7 <LOD	3.6	21.5	13 <LOD	33.9 <LOD	43.5 <LOD	66.3 <LOD	76.35	1 of 1	NA	NA	NA	NA	NA	NA	NA	
25 114.6	13.6 <LOD	12.75 90.4	37.1 <LOD	18.9	<LOD	69.6 <LOD	129 <LOD	450 1069.6	430 <LOD	430	<LOD	375	1 of 1	NA	NA	NA	NA	NA	
26 <LOD	11.1 <LOD	8.1 <LOD	28.5 <LOD	11.1	106.6	41.9 <LOD	85.2 <LOD	270 493.6	250 <LOD	250	<LOD	240	1 of 1	NA	NA	NA	NA	NA	
27 <LOD	12.9 <LOD	9.75 <LOD	32.7 <LOD	13.2	<LOD	70.95 <LOD	100.65 <LOD	315 <LOD	435 <LOD	435	<LOD	285	1 of 1	NA	NA	NA	NA	NA	
28 NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1 of 1	367.2	0	
29 <LOD	3.6 <LOD	3.45 <LOD	5.1 <LOD	3.3	27.9	12.1 <LOD	30.9 <LOD	36.15 <LOD	53.55 <LOD	61.95	1 of 1	NA	NA	NA	NA	NA	NA	NA	
30 104.5	13.1 14.5	8.8 103.8	36.4 <LOD	18.75	101.9	46.9 <LOD	126.75 <LOD	450 <LOD	630 <LOD	360	1 of 1	NA	NA	NA	NA	NA	NA	NA	
31 NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1 of 1	369.4	0	
32 <LOD	9.75 <LOD	9.75 <LOD	13.8 <LOD	9	<LOD	49.5 <LOD	86.1 <LOD	139.65 <LOD	210	341.2	170	1 of 1	NA	NA	NA	NA	NA	NA	
33 <LOD	4.05 <LOD	4.2 <LOD	6.3 <LOD	4.2	28.3	14.8 <LOD	39.45 <LOD	64.5 <LOD	95.85	261.6	72.2	1 of 1	NA	NA	NA	NA	NA	NA	
34 <LOD	4.65 <LOD	4.95 <LOD	6.9 <LOD	4.05	25.2	16 <LOD	43.8 <LOD	70.5 <LOD	112.2	285.8	83.5	1 of 1	NA	NA	NA	NA	NA	NA	
35 <LOD	4.5 <LOD	4.5 <LOD	6.6 <LOD	4.2	23.6	15.3 <LOD	39.15 <LOD	57.3 <LOD	85.8 <LOD	92.4	1 of 1	NA	NA	NA	NA	NA	NA	NA	
36 <LOD	10.35 <LOD	7.8 <LOD	16.35 <LOD	8.25	<LOD	46.65 <LOD	81.45 <LOD	225 <LOD	330	426	160	1 of 1	NA	NA	NA	NA	NA	NA	
37 <LOD	11.4 <LOD	7.65 39.8	20.5 <LOD	11.4	99.6</														

56 <LOD	5.55 <LOD	5.85 <LOD	8.25 <LOD	5.7 <LOD	26.85 <LOD	49.05 <LOD	67.5 <LOD	99.15 <LOD	111.3 1 of 1	NA
57 <LOD	5.55 <LOD	5.85 <LOD	8.25 <LOD	5.7 <LOD	26.85 <LOD	49.05 <LOD	67.5 <LOD	99.15 <LOD	111.3 1 of 1	NA
58 <LOD	5.55 <LOD	5.85 <LOD	8.25 <LOD	5.7 <LOD	26.85 <LOD	49.05 <LOD	67.5 <LOD	99.15 <LOD	111.3 1 of 1	NA
59 <LOD	12.6 <LOD	9.15 <LOD	30.75 <LOD	12.3 264.8	58 135.5	84.1 <LOD	405 1169.6	410 1560	290 1 of 1	NA
60 <LOD	12.75 <LOD	8.85 36.7	17.6 <LOD	11.7 <LOD	61.95 <LOD	98.25 <LOD	270 <LOD	390 764.4	200 1 of 1	NA
61 124	13.6 <LOD	12.15 65.2	36.8 <LOD	18.6 88.4	48.7 <LOD	133.35 <LOD	450 <LOD	645 <LOD	360 1 of 1	NA
62 <LOD	11.25 <LOD	8.4 31.6	17.9 <LOD	11.1 145.1	45.7 <LOD	97.35 <LOD	300 <LOD	420 432	190 1 of 1	NA
63 NA	NA	NA	NA	NA	NA	NA	NA	NA	1 of 1	370 0
64 NA	NA	NA	NA	NA	NA	NA	NA	NA	1 of 1	367 0
65 <LOD	4.95 <LOD	5.4 <LOD	7.5 <LOD	4.65 <LOD	26.25 <LOD	44.7 <LOD	54.15 <LOD	79.05 <LOD	93.15 1 of 1	NA
66 117	10.9 <LOD	10.2 74.2	29.8 <LOD	15.6 98.1	38.9 <LOD	105.15 <LOD	360 <LOD	510 <LOD	285 1 of 1	NA
67 <LOD	10.35 <LOD	8.1 <LOD	28.35 <LOD	10.95 <LOD	57.3 270.4	67.1 <LOD	285 392.2	260 <LOD	240 1 of 1	NA
68 <LOD	16.65 <LOD	14.55 <LOD	64.65 <LOD	22.95 664	99.8 <LOD	255 1329.6	660 2428.8	920 <LOD	735 1 of 1	NA
69 <LOD	5.4 <LOD	5.4 <LOD	7.8 <LOD	5.4 <LOD	25.95 <LOD	47.4 <LOD	68.55 <LOD	100.8 178.6	81.7 1 of 1	NA
70 <LOD	14.55 <LOD	12.6 79	37.3 <LOD	19.5 381.4	79.3 281	150 910.4	580 2148.8	810 <LOD	675 1 of 1	NA
71 <LOD	15.15 <LOD	16.65 <LOD	26.7 <LOD	18.45 <LOD	165 1680	260 <LOD	330 <LOD	330 <LOD	390 1 of 1	NA
72 <LOD	4.2 <LOD	4.5 <LOD	6.45 <LOD	4.2 <LOD	22.05 <LOD	39.3 <LOD	54.6 <LOD	84 121.1	63.7 1 of 1	NA
73 <LOD	11.4 <LOD	8.7 <LOD	37.35 <LOD	13.2 90.8	43.8 <LOD	95.55 <LOD	330 <LOD	465 557.2	200 1 of 1	NA
74 <LOD	10.05 <LOD	8.1 41.4	21.2 <LOD	11.85 133.5	43.4 116.7	65.9 <LOD	330 731.6	310 592.8	200 1 of 1	NA
75 NA	NA	NA	NA	NA	NA	NA	NA	NA	1 of 1	368.4 0
76 <LOD	2.55 <LOD	2.55 <LOD	3.9 <LOD	2.55 25.5	9 <LOD	23.25 <LOD	35.1 55.7	37.1 146.2	41.2 1 of 1	NA
77 <LOD	4.5 <LOD	4.35 <LOD	6.75 <LOD	4.35 27.7	15.5 <LOD	38.85 <LOD	48.15 <LOD	80.4 <LOD	90.75 1 of 1	NA
78 <LOD	12.6 <LOD	8.25 <LOD	27.15 <LOD	10.8 <LOD	63.75 <LOD	94.95 398.2	200 559.2	280 <LOD	255 1 of 1	NA
79 <LOD	11.55 <LOD	8.1 <LOD	27.45 <LOD	11.25 103.3	44.6 115.5	68 <LOD	330 860	320 963.2	220 1 of 1	NA
80 <LOD	11.55 <LOD	9 <LOD	32.1 <LOD	12.45 117.4	47.6 <LOD	109.95 <LOD	360 553.2	340 <LOD	285 1 of 1	NA
81 <LOD	10.8 <LOD	8.85 <LOD	30.3 <LOD	12 156	46.1 <LOD	100.35 <LOD	330 606	310 <LOD	270 1 of 1	NA
82 <LOD	11.85 <LOD	9.15 <LOD	32.25 <LOD	12.9 154	48.4 <LOD	109.2 424.8	240 657.6	340 <LOD	300 1 of 1	NA
83 <LOD	13.05 <LOD	10.05 <LOD	36.75 <LOD	13.8 186.4	57.5 <LOD	129.9 <LOD	420 603.6	400 452.8	260 1 of 1	NA
84 <LOD	11.4 <LOD	8.55 <LOD	32.4 <LOD	12.75 149.2	49.6 <LOD	114.15 425.6	250 532.8	350 <LOD	315 1 of 1	NA
85 <LOD	12.15 <LOD	9.45 <LOD	34.2 <LOD	13.5 124.5	51.2 <LOD	119.4 <LOD	390 571.6	370 <LOD	345 1 of 1	NA
86 <LOD	11.7 <LOD	9.6 <LOD	33.15 <LOD	12.45 109.7	49.1 139.7	77.7 <LOD	375 773.2	360 <LOD	315 1 of 1	NA
87 <LOD	5.25 <LOD	5.4 <LOD	7.65 <LOD	4.8 <LOD	25.65 <LOD	45 <LOD	57.3 <LOD	92.4 <LOD	100.2 1 of 1	NA
88 102.6	12.7 <LOD	11.7 82.4	34.7 <LOD	17.4 103.7	47.1 <LOD	124.65 <LOD	420 944.8	410 <LOD	345 1 of 1	NA
89 <LOD	13.2 <LOD	10.35 32.3	20.1 <LOD	13.05 <LOD	69.15 <LOD	117 <LOD	360 <LOD	510 513.2	230 1 of 1	NA
90 NA	NA	NA	NA	NA	NA	NA	NA	NA	1 of 1	367 0

APPENDIX E, TABLE E-2

Header: XRF Data July 29 to August 5, 2003

Site: USS Lead Vicinity

Bulk

Sample Results in ppm

No	Sr	Sr Error	Se	Se Error	As	As Error	Hg	Hg Error	Cu	Cu Error	Ni	Ni Error	Co	Co Error	Mn	Mn Error	Cr	Cr Error	Cycle	RES7	RES7 Error
91 <LOD	3.75 <LOD	3.9 <LOD	5.7 <LOD	3.6	34	13.5 <LOD	33.6 <LOD	50.85 <LOD	73.2 <LOD	82.2 1 of 1	NA										
92 111.7	13 <LOD	12.15 93.5	35.6 <LOD	18.15	73.1	46.4 <LOD	127.5 <LOD	435 <LOD	600 <LOD	360 1 of 1	NA										
93 <LOD	2.7 3.1	1.9 <LOD	4.05 <LOD	2.55	21.3	8.8 <LOD	22.8 <LOD	28.05 <LOD	41.25 <LOD	46.65 1 of 1	NA										
94 <LOD	10.65 <LOD	7.95 <LOD	23.85 <LOD	10.2	95.7	40.7 <LOD	94.2 <LOD	300 509.6	280 <LOD	255 1 of 1	NA										
95 <LOD	12.3 <LOD	9.6 <LOD	37.8 <LOD	14.25	90.8	47.3 <LOD	116.55 <LOD	390 <LOD	540 <LOD	330 1 of 1	NA										
96 <LOD	14.85 <LOD	11.55 <LOD	45.3 <LOD	16.95 <LOD	150 6208	230 <LOD	465 <LOD	615 1469.6	310 1 of 1	NA											
97 <LOD	12.75 <LOD	10.5 <LOD	41.4 <LOD	15.3 125.2	55 <LOD	109.05 <LOD	360 <LOD	495 <LOD	300 1 of 1	NA											
98 <LOD	12.9 <LOD	9.75 <LOD	41.55 <LOD	15.3 130.3	55.1 <LOD	112.8 <LOD	375 <LOD	510 <LOD	315 1 of 1	NA											
99 <LOD	13.35 <LOD	10.2 <LOD	42.45 <LOD	15.15 <LOD	84.9 307.4	87 <LOD	390 629.6	360 <LOD	345 1 of 1	NA											
100 <LOD	13.2 <LOD	10.2 48.1	28.4 <LOD	15.15 137.2	56.7 <LOD	114.9 <LOD	375 <LOD	540 408	230 1 of 1	NA											
101 <LOD	13.35 <LOD	10.05 <LOD	42.45 <LOD	15.6 100.2	55 <LOD	112.35 <LOD	375 <LOD	510 <LOD	315 1 of 1	NA											
102 <LOD	12.6 <LOD	9.75 <LOD	38.7 <LOD	14.25 <LOD	75.75 <LOD	105.75 <LOD	330 516.4	320 <LOD	285 1 of 1	NA											
103 <LOD	1																				

116 <LOD	10.8 <LOD	7.8 <LOD	20.4 <LOD	9.45 <LOD	53.55	105	65.8 <LOD	300 <LOD	420	492	190 1 of 1	NA
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Notes to Data Table:

- 1 XL number means reading number on the Niton XRF
- 2 Site is the XRF location or the bag blank or the SRM or the self-calibration
- 3 Insp means the person collecting the sample at the XRF location, or the operator of the XRF, as applicable
- 4 SRM means Standard Reference Material 2711
- 5 MJM is Mike Mikulka; MC is Mirtha Capiro; MES is Mike Sickles

APPENDIX E, TABLE E-3

XRF Data August 6 through 10, 2003

Site: Vicinity of USS Lead, East Chicago, IN

No	XLNo	Site	Insp	Sample	Notes	Serial #XL700-U2167NR4212						Bulk	Sample Results in ppm						
						Ssec	Date/Time	Fe (ppm)	Fe Error	Pb (ppm)	Pb Error	Zn (ppm)	Zn Error	Zr (ppm)	Zr Error	Rb (ppm)	Rb Error	Mo (ppm)	Mo Error
1	1	Calibration	MJM		Shutter Ca	19.7	8/6/2003 11:19	NA		NA		NA		NA		NA		NA	
2	2	Bag Blank	MJM			60.6	8/6/2003 11:21	<LOD	43.95	<LOD	7.2	24.1	8.3	<LOD	1.8	<LOD	3.9	7.3	2
3	3	SRM 2711	MJM			75.4	8/6/2003 11:25	21388.8	530	1100	43.5	321.4	33.8	214.8	9.4	162.4	15.4	<LOD	7.8
4	4	X58	MJM		Riley Pk, SW	60.5	8/6/2003 11:42	12896	390	191.9	19.5	291.4	31.4	109.6	6.6	67.5	10.4	<LOD	6.75
5	5	X59	MJM		Riley Pk, NW	80.5	8/6/2003 11:47	14592	360	239.4	18.4	477.6	32.3	117.5	5.9	53.9	8.4	<LOD	5.7
6	6	X60	MC		Riley Pk, NE	71.6	8/6/2003 11:58	13593.6	370	309.8	21.6	509.6	35.3	158.6	7	44	8.4	<LOD	6.45
7	7	X61	MC			132.3	8/6/2003 12:06	6400	210	144.9	13.2	110.7	16.9	98.6	4.7	42.8	6.8	<LOD	5.1
8	8	Bag Blank	MJM			61.7	8/6/2003 12:22	117	48.1	<LOD	6.6	12.6	7.8	<LOD	1.8	<LOD	4.05	7.8	2.1
9	9	X63	MJM			100.6	8/6/2003 12:35	9299.2	260	161.2	14.2	335	24.9	66.1	4.3	58.1	7.6	<LOD	4.8
10	10	X64	MC		Day Care	80.4	8/6/2003 12:51	13388.8	360	204.5	17.7	520.4	34.3	61.8	4.8	51.6	8.5	<LOD	5.55
11	11	X62	MC			64.5	8/6/2003 13:03	9996.8	330	239.4	20.3	367.8	31.9	92.7	6	59.7	9.5	<LOD	6.3
12	12	Calibration	MJM		Shutter Ca	19.7	8/6/2003 13:21	NA		NA		NA		NA		NA		NA	
13	13	Bag Blank	MJM			60.3	8/6/2003 15:35	<LOD	49.05	<LOD	6.75	18.2	7.8	<LOD	1.8	<LOD	3.6	5.1	2
14	14	X65	MES	S20	4726 Melville; Pb avg = 592	70.1	8/6/2003 15:55	11897.6	340	364.2	23.3	602.8	38.2	89.7	5.7	41.5	8.4	<LOD	5.85
15	15	X66	MES		Precision test	65.4	8/6/2003 16:04	18598.4	480	574	31.4	1029.6	53.8	122.6	7.2	37.5	9.4	7.2	4.7
16	16	P-X66-2	MJM		Precision test	62.8	8/6/2003 16:08	19392	490	600.4	31.8	1089.6	55.1	130.1	7.3	30.9	8.9	<LOD	6.75
17	17	P-X66-3	MJM		Precision test	62.7	8/6/2003 16:11	18496	460	593.6	30.8	1080	53.2	142.1	7.3	38.8	9.1	<LOD	6.45
18	18	P-X66-4	MJM		Precision test	71	8/6/2003 16:15	19097.6	450	584.4	28.7	1149.6	51.5	145.4	7	39.9	8.6	<LOD	6.3
19	19	P-X66-5	MJM		Precision test	64	8/6/2003 16:19	21696	510	580.4	30.6	1109.6	54	131.2	7.2	31.7	8.8	<LOD	6.6
20	20	P-X66-6	MJM		Precision test	60.5	8/6/2003 16:24	19200	510	600	33.4	1129.6	58.7	120.8	7.4	34.1	9.6	<LOD	7.35
21	21	P-X66-7	MJM		Precision test	65.9	8/6/2003 16:30	18892.8	470	603.6	31.1	1049.6	53.2	122.3	6.9	37.4	9	<LOD	6.75
22	22	X67	MC			61.7	8/6/2003 16:38	16294.4	430	373	25	702	43.6	105.9	6.5	46.1	9.2	<LOD	6.3
23	23	X68	MC			64.2	8/6/2003 16:43	11200	340	320.4	22.5	666.8	40.5	99.7	6	54.7	9.2	<LOD	6.15
24	24	X69	MES			72.1	8/6/2003 16:48	10496	330	287.4	21.2	402.8	32.3	62	5.1	40.4	8.4	<LOD	5.85
25	25	NV	MJM		NO GUARD	4.8	8/6/2003 16:52	<LOD	165	<LOD	24.75	<LOD	42.45	<LOD	6.3	<LOD	11.25	<LOD	10.05
26	26	Bag Blank	MJM			30.9	8/6/2003 16:52	<LOD	73.8	<LOD	8.55	<LOD	15.6	<LOD	2.4	<LOD	5.55	5.1	2.7
27	27	X70	MES		Resco FP	64	8/6/2003 16:56	25395.2	520	210.4	18	450	32.6	57	4.6	28.4	7.1	<LOD	5.25
28	28	X71	MC		Resco FP2	70.4	8/6/2003 17:07	5468.8	230	244.6	19	189.7	23.2	41.5	4.3	47.5	8.2	<LOD	5.25
29	29	SRM 2711	MJM			72.2	8/6/2003 17:12	20800	530	1100	44.4	309.2	34.4	211	9.5	157.7	15.5	<LOD	7.95
30	30	Calibration	MJM		Shutter Ca	19.7	8/7/2003 9:30	NA		NA		NA		NA		NA		NA	
31	31	Bag Blank	MJM			61	8/7/2003 9:46	<LOD	46.65	<LOD	6.3	17.4	7.7	<LOD	1.8	<LOD	3.75	4.8	1.9
32	32	SRM 2711	MJM			62.3	8/7/2003 10:17	22092.8	600	1100	48.5	347.4	39	214	10.5	168.9	17.4	<LOD	8.85
33	33	X72	MC		Resco Lawn	82	8/7/2003 10:57	7456	250	370.4	21.2	258.4	24.3	56.2	4.4	53.3	8	<LOD	5.1
34	34	NV	MJM		Bad reading	18.6	8/7/2003 11:04	9388.8	620	408	49.4	400	66.2	70.9	10.6	40	16.7	<LOD	12
35	35	X73	MES	S22	Resco L2	67	8/7/2003 11:05	11795.2	430	373.6	28.5	332.6	80.4	72.8	6.4	55.7	10.9	7.5	4.9
36	36	X73	MES		R2: high Ni	75.3	8/7/2003 11:10	10400	320	395.4	24	382.8	31.1	72.5	5.2	51.4	8.8	<LOD	5.85
37	37	X74	MC			72.5	8/7/2003 11:18	13593.6	370	377.6	23.6	717.2	40.7	102.6	6	53.8	9	<LOD	5.85
38	38	X75	MJM		Learning Ctr.	63.8	8/7/2003 11:24	17190.4	460	235.8	21.1	382	34	117.4	6.8	67	10.3	7	4.6
39	39	Bag Blank	MJM			45.7	8/7/2003 11:31	<LOD	48.3	<LOD	7.2	15.1	8.3	<LOD	1.95	<LOD	4.05	5.4	2.1
40	40	X71	MJM		Retest: drier	77.2	8/7/2003 11:43	7155.2	270</										

52	51	X77	MES	S24	N. of DuPont; RR2	80.8	8/7/2003 14:38	10496	300	713.6	29.2	572	34.2	119.5	5.9	45.5	8	<LOD	5.5
53	52	X80	MC	S25	4926 Grasselli	62.1	8/7/2003 14:58	13888	410	396.6	26.2	514.4	38.7	121.1	6.9	49	9.5	<LOD	6.75
54	53	SRM 2711	MJM			100.7	8/7/2003 15:28	21593.6	470	1120	38.6	307	29.3	209.8	8.2	168.3	13.7	<LOD	6.9
55	54	X81	MES			72.1	8/7/2003 15:37	12198.4	360	325.4	23.2	662.8	41	75.5	5.7	48.2	9.2	<LOD	6.3
56	55	Bag Blank	MJM	OK		45.6	8/7/2003 16:12	<LOD	47.85	<LOD	7.2	16.2	8.4	<LOD	1.8	<LOD	4.2	4.6	2.1
57	56	Calibration	MC	Shutter Ca		19.7	#####	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
58	57	Bag Blank	MC			60.4	#####	349	79.1	<LOD	8.55	<LOD	40.05	<LOD	1.95	<LOD	4.65	8.3	2.3
59	58	NV	MC	Cancelled		16.2	#####	<LOD	84.15	<LOD	11.1	28.5	15.7	<LOD	3.15	<LOD	7.2	<LOD	5.55
60	59	Bag Blank	MC	OK		74.4	#####	<LOD	47.7	<LOD	6	19.4	7.1	<LOD	1.5	<LOD	3.45	4.6	1.7
61	60	SRM 2711	MC			65.8	#####	21388.8	560	1069.6	45.7	262.6	33.8	212.2	9.9	160.6	16.3	<LOD	8.1
62	61	X78	MES	RR3: Wet; Pb avg. = 583		67.5	#####	6128	280	596	32.8	1460	64.2	87.6	6.4	41.8	9.6	<LOD	6.75
63	62	P-X78-2	MC	Precision test		68.8	#####	6297.6	270	610	32.5	1600	65.7	95.3	6.5	49	9.8	<LOD	6.6
64	63	P-X78-3	MC	Precision test		67.5	#####	7296	280	612	31.2	1729.6	65.6	95.2	6.2	55.5	9.7	<LOD	6.3
65	64	P-X78-4	MC	Precision test		75.4	#####	6585.6	250	595.2	28.8	1560	58.4	98.8	5.9	51.1	8.9	<LOD	5.85
66	65	P-X78-5	MC	Precision test		82.4	#####	6675.2	250	530	27	1460	55.8	91.6	5.7	43.2	8.4	<LOD	5.85
67	66	P-X78-6	MC	Precision test		77.6	#####	6547.2	240	576.8	27.6	1460	54.7	91.3	5.5	51.5	8.6	<LOD	5.7
68	67	P-X78-7	MC	Precision test		66.3	#####	6057.6	250	557.6	29.1	1520	59.7	92.3	6	57.1	9.5	<LOD	6.15
69	68	X83	MC	S28	CME S2; resampled 8/12 MC	71	#####	14195.2	400	585.6	30.6	923.2	48.7	551.2	13.8	35.7	8.8	9.7	6.4
70	69	X82	MC	CME South1		96.2	#####	10598.4	280	642.4	25.6	1729.6	52.9	736	13.1	28	6.6	<LOD	8.25
71	70	Bag Blank	MC	OK		70.1	#####	<LOD	41.4	<LOD	6.45	18.5	7.3	<LOD	1.65	<LOD	3.6	5.4	1.8
72	71	NV	MC	Interupted		1.6	#####	21388.8	4000	1129.6	330	<LOD	840	251	76	225	130	<LOD	60.45
73	72	NV	MC	Interupted		0	#####	10099.2	93.9	2028.8	15.7	5920	32.5	984	4.8	483.2	6.3	983.2	4.6
74	73	NV	MC	Interupted		0.8	#####	10099.2	100	2188.8	17.6	2880	25.5	413.6	3.5	286.4	5.9	1029.6	4.9
75	74	Bag Blank	MC	OK		63.4	#####	<LOD	44.4	<LOD	6.6	14.6	7.5	<LOD	1.65	<LOD	3.75	5.8	1.9
76	75	SRM 2711	MC	Interupted		36.8	#####	21798.4	760	1080	61.5	308	49.2	206	13.3	163.8	22.1	<LOD	11.4
		SRM 2711	MC			67.5	#####	21491.2	550	1049.6	44.5	318.6	35.3	211.8	9.8	157.5	15.9	<LOD	8.4

Notes to Data Table:

- 1 XL number means reading number on the Niton XRF
- 2 Site is the XRF location or the bag blank or the SRM or the self-calibration
- 3 Insp means the person collecting the sample at the XRF location, or the operator of the XRF, as applicable
- 4 SRM means Standard Reference Material 2711
- 5 MJM is Mike Mikulka; MC is Mirtha Capiro; MES is Mike Sickles

XRF Data August 6 through 10, 2003
Site: Vicinity of USS Lead, East Chicago, IN

APPENDIX E, TABLE E-3
Serial #XL700-U2167NR4212

Bulk Sample Results in ppm

No	Sr (ppm)	Sr Error	Se (ppm)	Se Error	As (ppm)	As Error	Hg (ppm)	Hg Error	Cu (ppm)	Cu Error	Ni (ppm)	Ni Error	Co (ppm)	Co Error	Mn (ppm)	Mn Error	Cr (ppm)	Cr Error	Cycle	RES7	RES7 Error	
1	NA		1 of 1	365.8	0																	
2	<LOD	3.75	<LOD	3.9	<LOD	5.7	<LOD	3.9	21	12.9	<LOD	33.6	<LOD	39.15	<LOD	60.15	<LOD	64.95	1 of 1	NA		
3	115.7	12.1	<LOD	10.95	85.8	33.1	<LOD	16.65	64.05	<LOD	118.65	<LOD	405	1000	390	<LOD	330	1 of 1	NA			
4	<LOD	11.25	<LOD	8.25	<LOD	22.95	<LOD	9.3	<LOD	62.4	357.2	77.7	<LOD	330	548	310	607.6	210	1 of 1	NA		
5	<LOD	9.9	<LOD	7.2	<LOD	21.45	<LOD	9	73.1	36.6	<LOD	89.25	<LOD	300	662	280	<LOD	270	1 of 1	NA		
6	<LOD	10.35	<LOD	7.65	<LOD	25.5	<LOD	10.35	96.2	40.3	99.7	64	<LOD	300	611.6	290	<LOD	270	1 of 1	NA		
7	<LOD	8.1	<LOD	6	<LOD	15.6	<LOD	7.05	<LOD	36.9	<LOD	65.55	<LOD	180	314	170	380.2	130	1 of 1	NA		
8	<LOD	3.75	<LOD	3.75	<LOD	5.7	<LOD	3.6	34	13.2	<LOD	33.3	<LOD	49.8	<LOD	81.45	87.1	57.4	1 of 1	NA		
9	<LOD	8.55	<LOD	6.45	<LOD	16.65	<LOD	7.5	<LOD	43.95	87.7	48.6	<LOD	210	<LOD	300	760	150	1 of 1	NA		
10	<LOD	10.05	<LOD	7.2	<LOD	21	<LOD	9	63.1	37.8	<LOD	90.6	<LOD	285	446.4	270	400	180	1 of 1	NA		
11	<LOD	10.8	<LOD	7.65	<LOD	23.55	<LOD	10.05	<LOD	54.9	<LOD	89.25	<LOD	270	<LOD	375	<LOD	255	1 of 1	NA		
12	NA		1 of 1	366.8	0																	
13	<LOD	3.6	<LOD	3.75	<LOD	5.7	<LOD	3.6	27.2	12.7	<LOD	32.25	<LOD	39.3	<LOD	60.3	<LOD	66.45	1 of 1	NA		
14	<LOD	11.4	<LOD	7.95	<LOD	27	<LOD	11.1	128.2	42.2	<LOD	90.9	<LOD	285	<LOD	390	<LOD	240	1 of 1	NA		
15	<LOD	14.1	<LOD	9.3	<LOD	36	<LOD	13.8	237.2	57	<LOD	114.75	<LOD	375	<LOD	525	<LOD	330	1 of 1	NA		
16	<LOD	14.1	<LOD	9.45	<LOD	36.75	<LOD	13.95	325.4	59.8	<LOD	116.25	<LOD	375	<LOD	525	<LOD	300	1 of 1	NA		
17	<LOD	13.8	<LOD	9.15	40	23.9	<LOD	13.95	293.6	56.9	<LOD	110.4	<LOD	360	731.2	340	<LOD	285	1 of 1	NA		
18	<LOD	12.9	<LOD	8.25	34.3	22.2	<LOD	12.75	274.4	53.9	<LOD	104.7	<LOD	360	742.8	330	<LOD	285	1 of 1	NA		
19	<LOD	13.95	<LOD	9	37.7	23.6	<LOD	13.2	227.4	56.1	<LOD	116.1	<LOD	390	<LOD	540	<LOD	300	1 of 1	NA		
20	<LOD	14.55	<LOD	9.6	<LOD	37.95	<LOD	14.1	290.8	62.3	<LOD	121.05	<LOD	405	<LOD	540	482.4	230	1 of 1	NA		
21	<LOD	13.2	<LOD	9	<LOD	35.55	<LOD	13.65	284.4	59.7	497.6	87.7	<LOD	375	<LOD	510	377	210	1 of 1	NA		
22	<LOD	12.15	<LOD	8.85	<LOD	28.95	<LOD	12	194.8	49.1	<LOD	106.65	<LOD	345	660.4	330	<LOD	300	1 of 1	NA		
23	<LOD	11.1	<LOD	8.1	<LOD	26.25	<LOD	10.65	102.7	43	<LOD	91.05	<LOD	285	<LOD	390	<LOD	225	1 of 1	NA		
24	<LOD	11.4	<LOD	7.8	<LOD	24.6	<LOD	10.05	76.8	38	<LOD	90.15	<LOD	270	<LOD	375	441.2	170	1 of 1	NA		
25	<LOD	12.6	<LOD	13.2	<LOD	19.65	<LOD	13.65	77.55	168.9	95.8	<LOD	165	<LOD	180	<LOD	225	1 of 1	NA			
26	<LOD	5.1	<LOD	5.1	<LOD	7.5	<LOD	4.95	34.4	17.6	<LOD	44.55	<LOD	57	<LOD	88.8	<LOD	103.2	1 of 1	NA		
27	<LOD	8.85	<LOD	7.2	<LOD	21.3	<LOD	9.3	70.5	37.2	<LOD	104.4	<LOD	390	<LOD	540	<LOD	300	1 of 1	NA		
28	<LOD	9.75	<LOD	6.9	<LOD	21.9	<LOD	8.7	<LOD	44.4	<LOD	75.45	<LOD	195	296.6	190	612.8	160	1 of 1	NA		
29	104.2	12.2	<LOD	11.25	85.6	33.9	<LOD	17.55	96.5	45	<LOD	122.85	<LOD	420	716.8	380	<LOD	330	1 of 1	NA		
30	NA		1 of 1	368.6	0																	
31	<LOD	3.6	<LOD	3.75	<LOD	5.4	<LOD	3.6	21.6	12.2	<LOD	31.2	<LOD	40.05	<LOD	59.55	<LOD	65.4	1 of 1	NA		
32	108.8	13.4	<LOD	12.6	107	37.3	<LOD	18.9	82.4	49.2	<LOD	133.65	<LOD	465	<LOD	645	<LOD	360	1 of 1	NA		
33	<LOD	9.3	<LOD	7.2	<LOD	24.75	<LOD	9.3	<LOD	44.4	<LOD	73.8	<LOD	210	<LOD	300	486	150	1 of 1	NA		
34	<LOD	21.15	<LOD	15.9	<LOD	56.25	<LOD	20.7	<LOD	127.8	902.4	170	<LOD	540	923.2	520	<LOD	555	1 of 1	NA		
35	<LOD	12.45	<LOD	10.65	<LOD	33	<LOD	12.45	<LOD	300	40678.4	690	<LOD	585	588.8	370	2188.8	330	1 of 1	NA		
36	<LOD	10.2	<LOD	7.8	<LOD	27.3	<LOD	10.8	<LOD	53.1	<LOD	86.7	<LOD	270	474.4	260	779.6	190	1 of 1	NA		
37	<LOD	10.8	<LOD	8.25	<LOD	27.3	<LOD	11.1	69.5	41.8	<LOD	91.5	<LOD	300	420	<LOD	255	1 of 1	NA			
38	<LOD	11.1	<LOD	8.1	<LOD	25.05	<LOD	10.95	<LOD	59.85	<LOD	107.55	<LOD	386.8	250	<LOD	510	386.6	210	1 of 1	NA	
39	<LOD	4.05	<LOD	4.2	<LOD	5																

51	<LOD	10.35	<LOD	7.65	35.5	22.3	<LOD	11.85	70.6	36.5	<LOD	80.4	<LOD	240	486.8	230	<LOD	225	1 of 1	NA
52	<LOD	12	<LOD	8.7	<LOD	29.7	<LOD	11.25	68.5	44.5	266.2	74.9	<LOD	330	649.6	320	539.2	210	1 of 1	NA
53	108	10.6	<LOD	9.6	107.4	29.6	<LOD	15	59.2	37.2	<LOD	103.8	<LOD	360	614.8	330	<LOD	285	1 of 1	NA
54	<LOD	12	<LOD	8.55	<LOD	27.15	<LOD	11.25	<LOD	64.2	115.5	66.2	<LOD	300	<LOD	420	817.2	200	1 of 1	NA
55	<LOD	4.2	<LOD	4.35	<LOD	6	<LOD	4.05	25.4	13.7	<LOD	34.95	<LOD	43.05	<LOD	62.1	<LOD	69.6	1 of 1	NA
56	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1 of 1	366.8	0
57	<LOD	4.35	<LOD	4.8	<LOD	7.05	<LOD	4.65	<LOD	107.85	12595.2	200	<LOD	180	<LOD	128.4	284	94.6	1 of 1	NA
58	<LOD	7.05	<LOD	7.35	<LOD	9.45	<LOD	7.35	<LOD	35.55	<LOD	58.65	<LOD	71.85	<LOD	123.45	<LOD	132.45	1 of 1	NA
59	<LOD	3.3	<LOD	3.3	<LOD	4.95	<LOD	3.15	31.4	11.6	<LOD	29.1	<LOD	37.5	<LOD	55.5	<LOD	63.45	1 of 1	NA
60	107.4	12.7	<LOD	12	96.9	35.1	<LOD	17.7	71.1	45	<LOD	127.35	<LOD	435	<LOD	600	<LOD	345	1 of 1	NA
61	<LOD	12.6	<LOD	9.6	<LOD	37.05	<LOD	14.25	<LOD	87.6	<LOD	97.5	<LOD	240	<LOD	345	<LOD	240	1 of 1	NA
62	<LOD	12.6	<LOD	10.05	<LOD	36.6	<LOD	14.4	<LOD	88.05	<LOD	90.75	<LOD	225	<LOD	330	<LOD	225	1 of 1	NA
63	<LOD	12	<LOD	8.7	<LOD	35.85	<LOD	14.1	<LOD	85.5	<LOD	90.75	<LOD	240	<LOD	345	410.4	170	1 of 1	NA
64	<LOD	11.25	<LOD	8.4	<LOD	32.7	<LOD	12.75	<LOD	77.4	<LOD	82.95	<LOD	210	<LOD	300	<LOD	210	1 of 1	NA
65	<LOD	11.1	<LOD	8.1	<LOD	31.05	<LOD	12.15	77.2	50.4	<LOD	81.75	<LOD	225	<LOD	315	459.6	160	1 of 1	NA
66	<LOD	10.95	<LOD	8.25	<LOD	31.65	<LOD	12.75	<LOD	74.1	<LOD	81.3	<LOD	210	<LOD	300	<LOD	195	1 of 1	NA
67	<LOD	11.7	<LOD	8.7	<LOD	33.15	<LOD	12.9	<LOD	79.65	<LOD	86.25	<LOD	225	<LOD	300	<LOD	210	1 of 1	NA
68	<LOD	12	<LOD	9.3	<LOD	34.8	<LOD	13.2	<LOD	71.85	<LOD	101.25	<LOD	330	<LOD	450	<LOD	270	1 of 1	NA
69	<LOD	8.85	<LOD	7.2	<LOD	29.1	<LOD	11.55	82	46.8	<LOD	78.9	<LOD	225	354.2	220	575.6	150	1 of 1	NA
70	<LOD	3.45	<LOD	3.6	<LOD	5.25	<LOD	3.45	28	12	<LOD	30.45	<LOD	36	<LOD	56.7	<LOD	62.85	1 of 1	NA
71	223.8	100	<LOD	87.9	<LOD	345	<LOD	104.7	<LOD	2100	44185.6	4998.4	<LOD	4348.8	<LOD	4500	<LOD	3000	1 of 1	NA
72	1169.6	6.3	1200	8.3	<LOD	18.3	1649.6	10.7	4640	38.8	<LOD	48.75	10694.4	92.1	7596.8	130	26982.4	190	1 of 1	NA
73	1429.6	7.4	1500	9.8	<LOD	20.4	1929.6	12.1	5468.8	40.8	<LOD	54.15	14195.2	110	12198.4	150	27392	200	1 of 1	NA
74	<LOD	3.6	<LOD	3.75	<LOD	5.25	<LOD	3.45	30.9	12.6	<LOD	32.1	<LOD	35.7	<LOD	58.35	<LOD	69.9	1 of 1	NA
75	127.6	17.7	<LOD	16.05	86.1	46.9	<LOD	22.95	<LOD	103.65	690.8	140	<LOD	585	876	550	<LOD	465	1 of 1	NA
76	110.1	12.6	<LOD	11.7	80.9	34	<LOD	17.55	68.7	44.6	<LOD	121.95	<LOD	420	834.4	400	<LOD	345	1 of 1	NA

Notes to Data Table:

- 1 XL number means reading number on the Niton XRF
- 2 Site is the XRF location or the bag blank or the SRM or the self-calibration
- 3 Insp means the person collecting the sample at the XRF location, or the operator of the XRF, as applicable
- 4 SRM means Standard Reference Material 2711
- 5 MJM is Mike Mikulka; MC is Mirtha Capiro; MES is Mike Sickles